...HNOLOGY DEPARTMENT

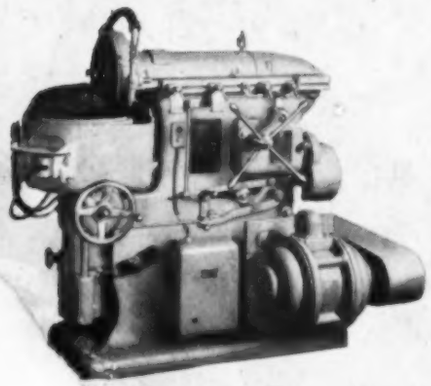
JANUARY 16, 1947

American Machinist

34th Annual Review Numbe

"NOW WE CUT 200% MORE GEARS PER SHARPENING

. . . when gear cutters are sharpened on our Heald Rotary"



Surface Grinding Machines, like the
otary shown here, can be furnished
all sizes and shapes of work.

HERE'S A MANUFACTURER who reports a 200% boost in gears cut per sharpening since he started using a Heald No. 22 Rotary to sharpen his gear cutters. In addition, he states that Heald surface grinding improves tooth contour of the gears, lengthens the life of cutters, lowers their cost, and cuts down-time.

Regardless of the job, you'll get a new conception of surface grinding when you use a Heald Rotary. That's because this machine features a horizontal wheelslide and rotary chuck. Actually, you grind with the wheel periphery—get faster production, finer accuracy, and a superior concentric finish.

Heald Rotaries are producing results like the above on a great variety of parts—with flat, concave or convex surfaces. Perhaps we can suggest ways to improve your own production with Heald Rotary Surface Grinding. We'll be glad to send you further details. Write: THE HEALD MACHINE COMPANY, Worcester 6, Mass.

HEALD

means more precision
. . . less cost

Branch Offices at Chicago • Cleveland • Dayton • Detroit • Indianapolis • Lansing • New York

AND SURFACE GRINDING MACHINES • BORE-MATIC PRECISION FINISHING MACHINES

American Machinist

MAGAZINE OF METALWORKING PRODUCTION

BURNHAM FINNEY ..... Editor
E. J. TANGERMAN ..... Managing Editor

•

Associate Editors: RUPERT LE GRAND, BEN C. BROSHEER (Chicago), HARRY J. WILLIAMS (News), HAROLD L. FLYNN, HARRY S. WHAREN, CHESTER S. RICKER (Detroit), BLAINE STUBBLEFIELD (Washington), ANDERSON ASHBURN.

•

Assistant Editors: JAMES VAN VOAST, ELEANOR W. MERRILL (Statistics).

•

SYDNEY OXBERRY ..... Art Director
ELSIE C. THOMAS ..... Assistant

•

DEXTER KEEZER .. Director, Economics Dept.

•

JOHN CHAPMAN .... World News Director

•

FRED H. COLVIN ..... Editor Emeritus

•

ALBERT HAUPTLI, JR. ..... Publisher
WILLIAM E. KENNEDY ..... Asst. Publisher

•

District Managers: JOHN H. KOCH, PHILIP G. WEATHERBY, Statler Building, Boston, Mass.; JAMES A. McGRAW, HUGH BRITTON, 330 W. 42nd St., New York 18, N. Y.; RICHARD FULLER, 16 So. Broad St., Philadelphia, Pa.; RAY DEEN, ANSON MEANOR, 520 N. Michigan Ave., Chicago, Ill.; ADOLPH F. TISCHER, Hanna Bldg., Cleveland, O.; ROBERT H. ANDERSON, 1110 Delta Ave., Cincinnati, O.; LEN P. CANTY, Penobscot Bldg., Detroit, Mich.; JOHN N. OTTERSON, 68 Post St., San Francisco, Calif.; ROY PHELAN, 621 So. Hope St., Los Angeles, Calif.; R. C. MAULTSBY, Rhodes-Haverty Bldg., Atlanta, Ga. Other offices: Continental Bldg., St. Louis, Mo.; National Press Bldg., Washington, D. C.; Oliver Bldg., Pittsburgh, Pa.; Aldwych House, Aldwych, London, W.C. 2.

•

Member of the Associated Business Papers and the Audit Bureau of Circulations.

•

COPYRIGHT 1947 by McGraw-Hill Publishing Company, Inc. All rights reserved.

•

Published every other Thursday. Price 35c per copy. Allow ten days for change of address. Subscription Rates: United States and possessions, $5 a year, $8 for two years, $10 for three years. Canada, $6 for one year, $10 for two years, $12 for three years. Pan-American countries, $10 for one year, $16 for two years, $20 for three years. All other countries, $20 a year, $30 for two years, $40 for three years. Please indicate position and company connection on all subscription orders. Entered as second-class matter, August 13, 1943, at Post Office, New York, N. Y., under the act of March 3, 1879. Printed in U.S.A. Return postage guaranteed.

Price this issue $1.00.

CONTENTS for January 16, 1947 ..... VOL. 91, NO. 2

(34th Annual Review Number)

SPECIAL REPORT

1947 Appraisal of Metalworking, with a Statistical Summary 101

Outlook 102
Machine Tools 106
Production Equipment 108
Metals 110
Components 112
Products 113
Backlogs 114
Wages, Prices 115

REVIEW

Machine Tools and Attachments 118
Tools and Accessories 150
Forming, Casting and Molding 166
Welding and Heat-Treating 174
Layout and Inspection 184
Cleaning and Finishing 192
Plant Service Equipment 195
Parts and Materials 204

INDEXES

Classified Index of Equipment 117
Metalworking "Opportunities" 391

NEWS OF METALWORKING

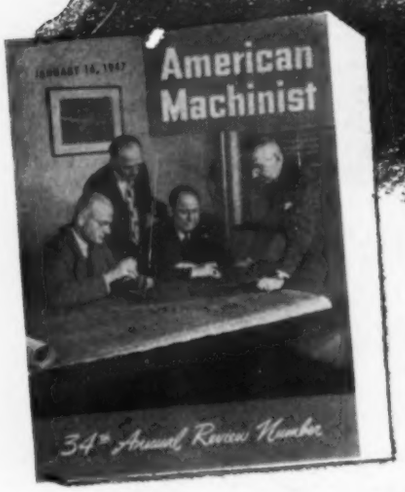
Spot News 97
Gaging Business 222
Detroit Letter 226
Labor 228
Washington Bulletin 230
Names in the News 234

DEPARTMENTS

Editorial 99
Reference Book Sheets 215
Letters to the Editor 238
New Books 242
Quotes 250
Tips for Top Shop Men 256

PUBLISHED BY McGRAW-HILL PUBLISHING COMPANY, INC.
330 West 42nd St., New York 18, N.Y.
Cables: "McGRAW-HILL, New York"

James H. McGraw, Jr., President; James H. McGraw, Founder and Honorary Chairman; Curtis W. McGraw, Senior Vice-President and Treasurer; Nelson Bond, Director of Advertising; Eugene Duffield, Editorial Assistant to the President; Joseph A. Gerardi, Secretary; J. E. Blackburn, Director of Circulation.



Chips and QUIPS

Tooling Up . . . Product and process improvements constantly occupy automobile engineers, require careful equipment purchases. Our front cover, taken especially—and appropriately—for this number, shows some of the recent planning activity for Buick's future-model program. Left to right: C. A. Chayne, chief engineer; E. T. Ragsdale, assistant chief engineer; O. W. Young, general manufacturing manager; and F. C. Pyper, master mechanic. Kodachrome courtesy of Buick Motor Division, General Motors Corporation.

Expanded . . . Major portion of this issue is, as you expected, the annual review of equipment, tools, parts and materials described in *American Machinist* during the past year. Each description has been distilled into a condensed explanation to save your time, and items are classified and indexed. But you may not have expected this catalog to be more than 25% larger than it was last year, containing over 950 items on over 1000 products. More new products was a factor, so also was persistent editorial digging.

Statistics . . . For the first time, this issue contains a picture of 1946 and a look at 1947, in chart and tabular form. This special report, first of an annual series, provides information which is, to a large degree, not available elsewhere, streamlined and condensed for ease of reference. The section is the result of combined operations by our statistical staff and the McGraw-Hill Economics Staff. Your comments and suggestions will be appreciated. . . . Reprints are, as usual, available.

Bonus . . . News, reference book sheets, and editorial also appear in the annual, to maintain an unbroken service.

Double Puff . . . Our editorial chest is puffed like a pouter's over receptions accorded recent special reports. Air-conditioning and Magnesium are approaching the sold-out stage, Machinability acted as preprint for a very special ASME annual-meeting report. One current order is for 2000 on Magnesium; a request says "very valuable . . . received at a very opportune time as we have had several recent requests from users of our machines for machining data on this material."

All for Nothing . . . Touring the exhibits at the Metal Show in November was a little like a movie Bank Night. Lottery-minded metalmen crowded the booths, which offered free chances on fishing rods, electric shavers and irons, kitchen mixers and other appliances. A steel company offered a variation on the old peas-in-the-jar-contest: each day they exhibited a tool and described the operation on which it was used. Closest guess as to the quantity of chips removed before regrind won a portable typewriter. Our editor who described these stunts didn't think much of them. But then — he didn't win.

Tummy . . .We have remarked at various times about the zany streak that prompts a manufacturer to give his product a "cute" name, usually a compound of sounds about the equivalent of those produced when a 2-year-old or a lisper speaks. Our only reason for mentioning it again is that the disease seems to be spreading. . . . Frankly, we suspect a contributing cause may be executives' wives, who believe they have a finger on the buyer's pulse just as their husbands believe they are experts in advertising and public speaking.

Man Bites Dog . . . Santa brought a steel-salesman friend 27 bottles—mostly Scotch—from "customers." Who's doing what to who—and when?

Coming . . .A. M. for January 30 will incorporate a timely special report on Labor Productivity prepared over the last several months by Chief Editor Burnham Finney. It should provide food for thought for management and labor alike. . . . To lead the issue is a detailed description of the finishing setup at Landers, Frary & Clark, reconverting an existing building efficiently.

Upset forging is showing its versatility. As an example, we will describe the cold-heading of pull rods as done by A. C. Sparkplug. . . .

Broaching—this time for real "matching" of heads on gold clubs, further welding setups, the conclusion of Mr. Aller's 2-part discussion on air gaging, suggestion for successful results from air-operated devices, Shop Shots —all are part of this issue as well.

$64 Question . . . The American Society of Tool Engineers held a press meeting in N. Y., announcing to all present the appointment of J. Cannon as its first full-fledged Public Relations Director. Clee V. Briner of the Pipe Machinery Co., chairman of the ASTE Public Relations Committee, finally called reporters to order (and away from the bar) and set forth the background of the ASTE. When he finished he asked, "Now are there any questions?" Deep silence. Twice more—more silence.

Then our representative decided to help out and in a clear pear-shaped tone asked, "Where's the Scotch?" That broke the ice, although Clee evaded the issue by mumbling something about a very good question.

(*Ed. Note to C. V. Briner:* Just where was the Scotch anyway?)

BEVEL GEAR *Design? Manufacture? Application?*

WE OFFER YOU:

1. SOLUTIONS OF YOUR BEVEL GEAR DESIGN PROBLEMS,
2. ESTIMATES OF YOUR PRODUCTION TIME AND COSTS,
3. RECOMMENDATIONS ON THE RIGHT EQUIPMENT FOR YOUR NEEDS,

WITHOUT OBLIGATION.

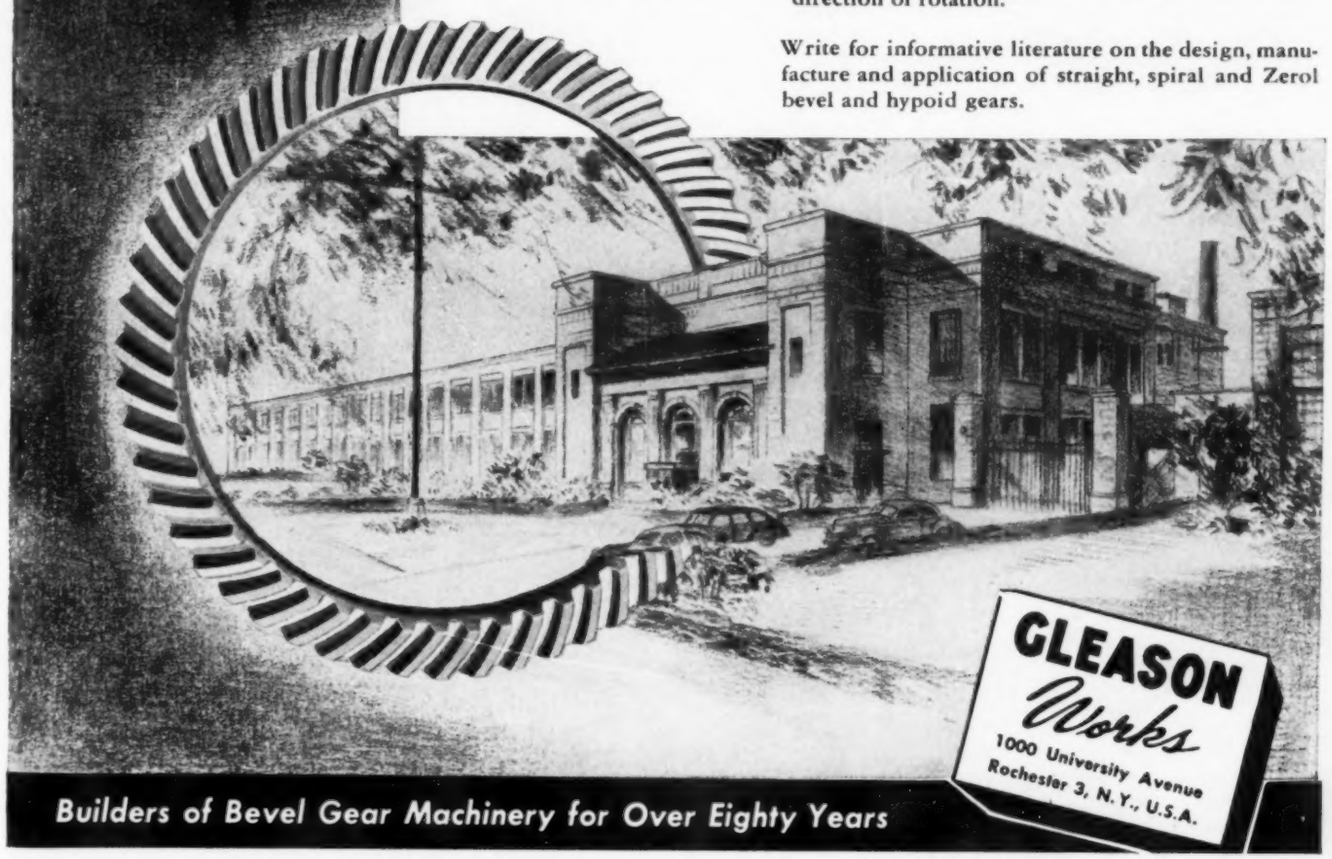
Highly skilled engineers backed by a wealth of experience in bevel gear design and manufacture will study your bevel gear drive designs, make suggestions, estimate production time and costs, and recommend the correct bevel gear manufacturing equipment.

Utilize the complete Gleason Engineering Service by sending us:

For production engineering: (1) Blueprints of your bevel gear designs, (2) Material specifications and manufacturing tolerances, (3) Quantity of gears to be produced per month, and (4) Number of working hours per month available for gear production.

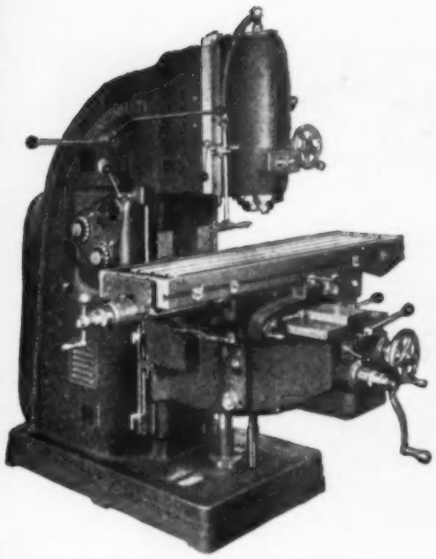
For design engineering: (1) Preliminary layouts or prints of proposed bevel gear drive designs, (2) Type of drive, (3) Horsepower and speed required, (4) Type of loading (constant, intermittent or shock), and (5) Driving member and direction of rotation.

Write for informative literature on the design, manufacture and application of straight, spiral and Zerol bevel and hypoid gears.



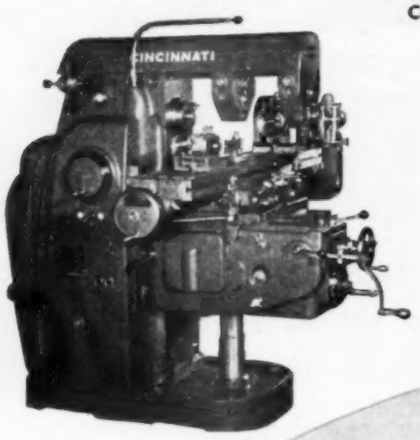
GLEASON Works
1000 University Avenue
Rochester 3, N.Y., U.S.A.

Builders of Bevel Gear Machinery for Over Eighty Years

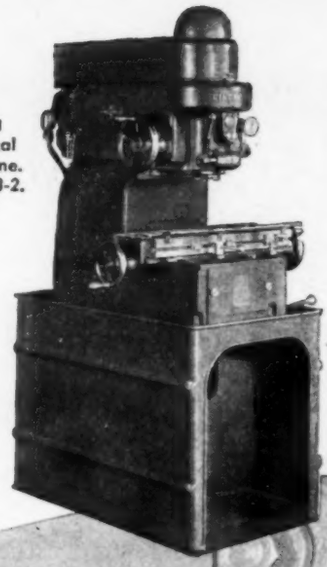


Above: CINCINNATI Vertical Dial Type Milling Machine. Catalog M-970-4.

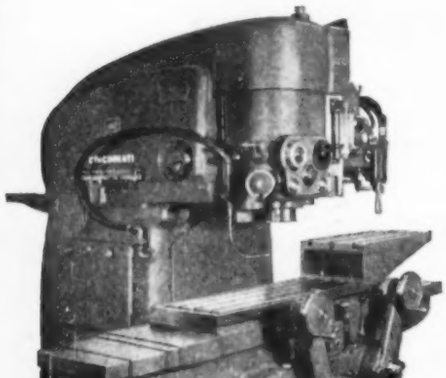
CINCINNATI No. 2 MI Universal Milling Machine. Catalog M-1506.



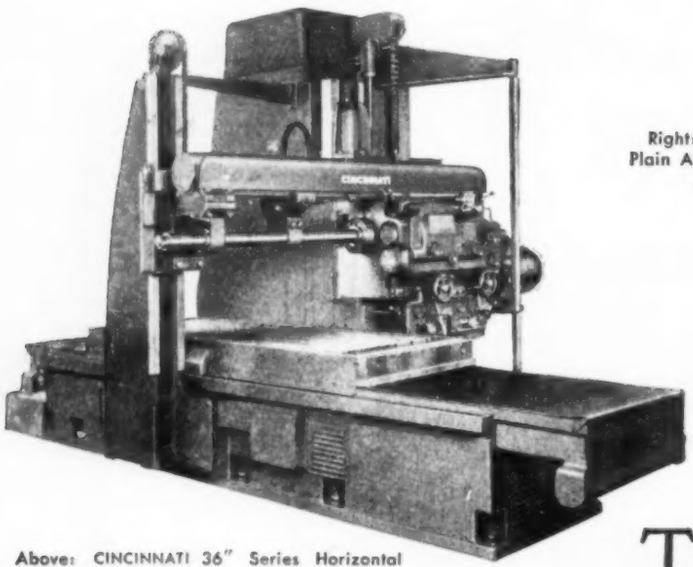
Right: CINCINNATI No. 0-8 Vertical Milling Machine. Catalog M-893-2.



CINCINNATI MACHINES for your Milling, Broaching and Cutter Sharpening Operations

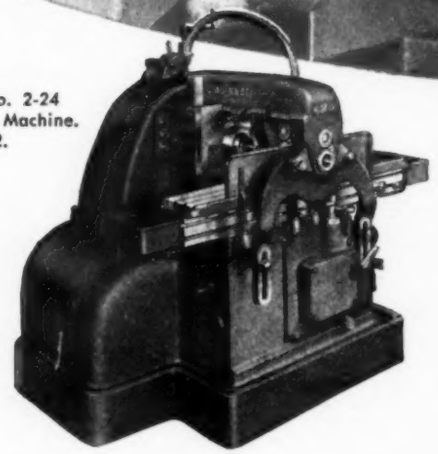


Above: CINCINNATI 16" Series Vertical Hydro-Tel Milling Machine. Catalog M-1497.



Above: CINCINNATI 36" Series Horizontal Hydro-Tel Milling Machine. Catalog M-1285.

Right: CINCINNATI No. 2-24 Plain Automatic Milling Machine. Catalog M-965-2.

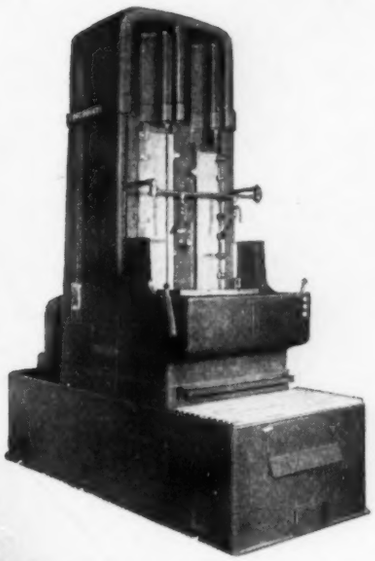


THE CINCINNATI

MILLING MACHINES

CINCINNATI No. 2 Cutter and Tool Grinder. Catalog M-962-4.

CINCINNATI Manoset Cutter and Tool Grinder. Catalog M-1386.



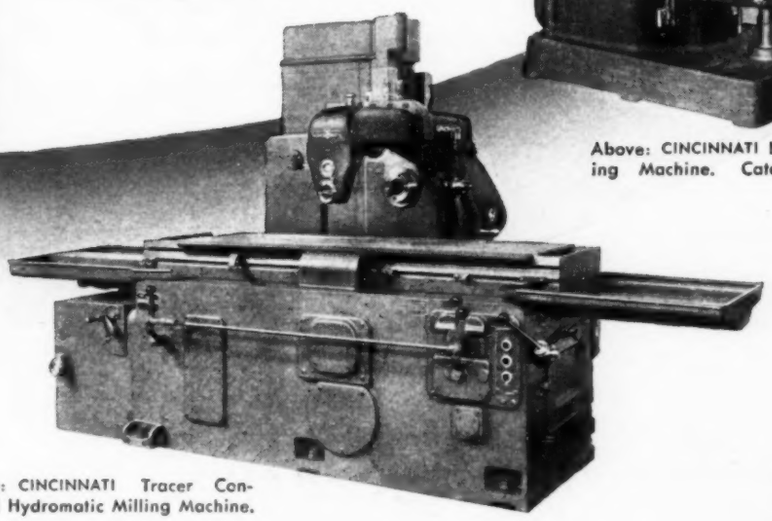
Above: CINCINNATI Duplex (double ram) Vertical Hydro-Broach. Catalog M-1387-1.

● Some Cincinnati Milling Machines are on repair ships at sea, ready to produce when needed. Others are in automotive plants, perhaps tooled up by our Application Engineers, producing around the clock, day in and day out. Regardless of your production requirements, one part or millions, there's a CINCINNATI Milling or Surface Broaching Machine suitable for the job. And to supply your milling and other metal cutting machines with correctly sharpened cutters when needed, there are three types of CINCINNATI Cutter and Tool Grinders. ¶ Cincinnati Milling Machines range from the small one h.p. 0-8's to the 50 h.p. Hydromatics . . . Vertical Hydro-Broach Machines range from one ton to 10 tons. General catalog No. M-1420-1 contains brief data on all these machines. Write for a copy.

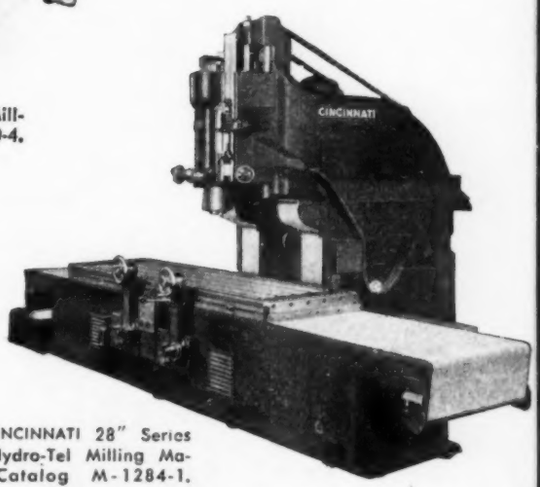
CINCINNATI

Above: CINCINNATI No. 1-18 Plain Automatic Milling Machine. Catalog M-848.

Above: CINCINNATI Dial Type Milling Machine. Catalog M-970-4.



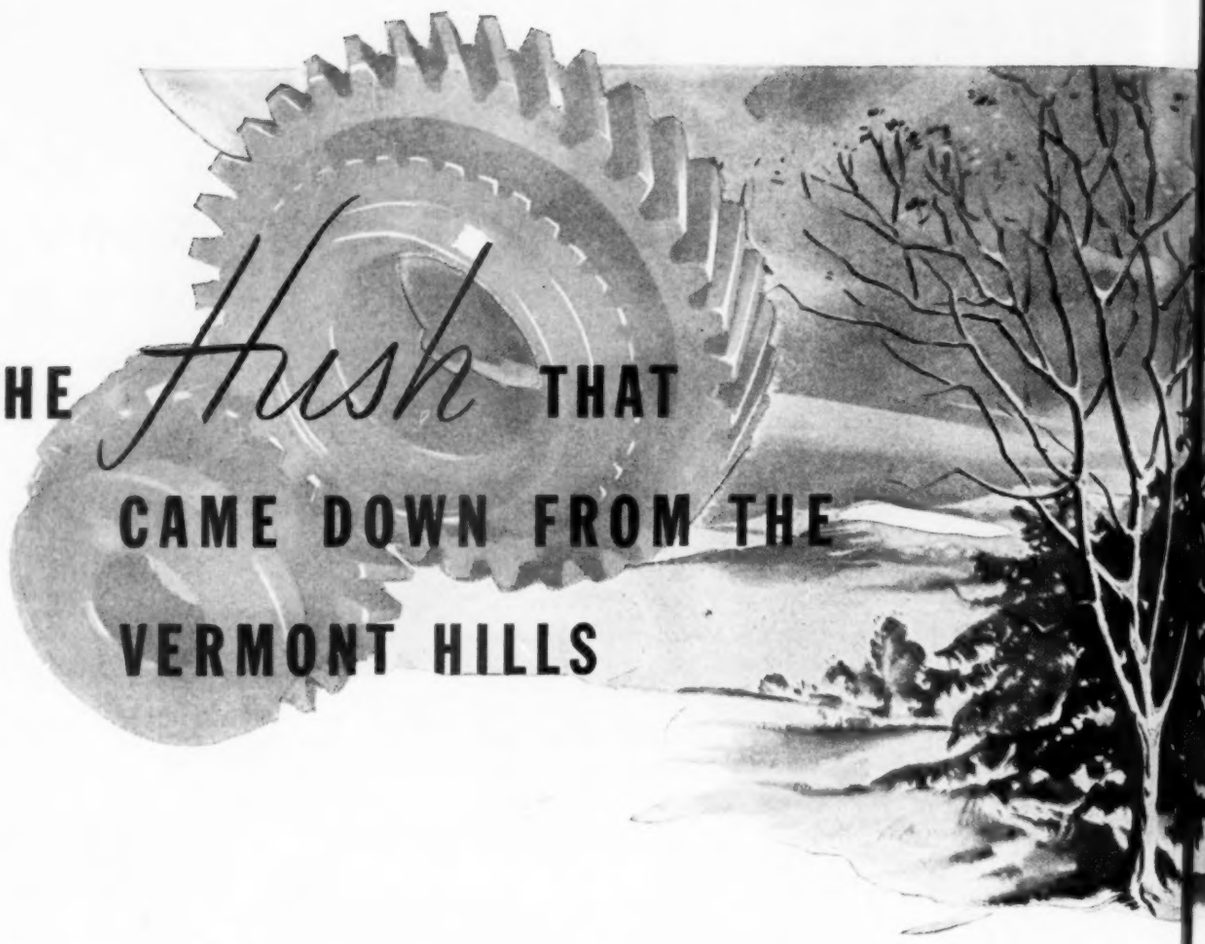
Above: CINCINNATI Tracer Controlled Hydromatic Milling Machine.



Above: CINCINNATI 28" Series Vertical Hydro-Tel Milling Machine. Catalog M-1284-1.

MILLING MACHINE CO. CINCINNATI 9, OHIO, U.S.A.

BROACHING MACHINES • CUTTER SHARPENING MACHINES



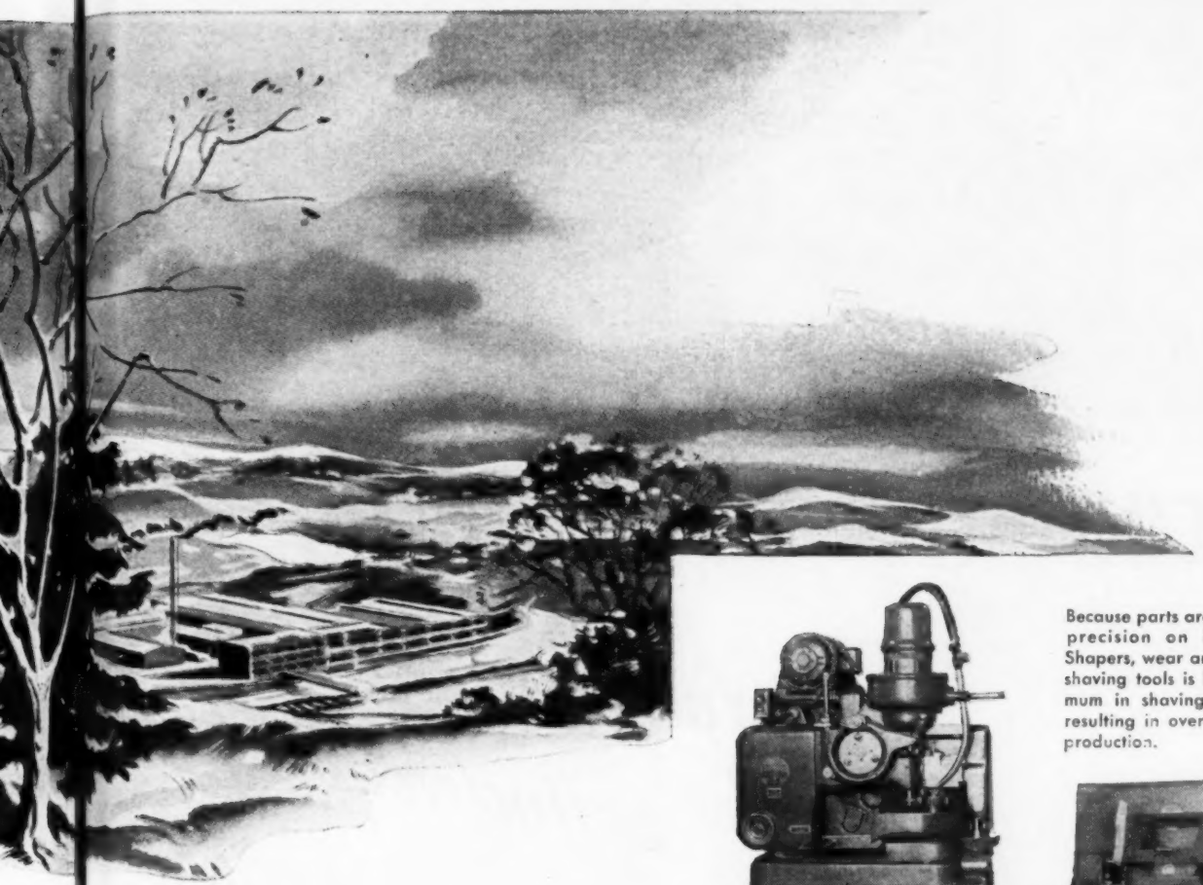
THE *Hush* THAT CAME DOWN FROM THE VERMONT HILLS

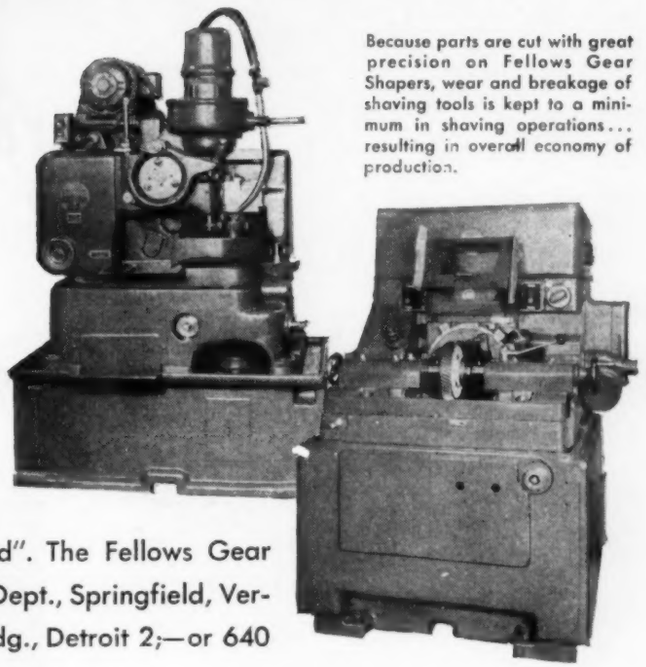
Quiet gear performance—the goal of production men—largely had its inception at the Fellows Gear Shaper plant in Springfield. For Fellows has brought to the world "gears that whisper" through a series of related machines and advanced techniques known as the "Fellows Method". The variety of gears that can be accurately produced by this method is astonishing, even to experienced engineers and production men, but the purpose of the "Fellows Method" is always the same: *more economical production of quiet, high-quality gears.*

On Fellows equipment you can manufacture, at low cost, precision gears ranging in pitch from 2 to 200, and in diameter from 1/8 inch to 100 inches. You can economically cut, finish, measure, and test external and internal, spur, helical, herringbone and face gears;

●**GOVERNMENT SURPLUS MACHINE TOOLS:** We are licensed under the WAR ASSETS ADMINISTRATION to act as dealers in the disposal of Government Surplus Machinery. Those interested in obtaining such machinery should contact our Main Office, Springfield, Vt.; or our offices in Detroit, Mich. and Chicago, Ill.

THE FELLOWS METHOD... MACHINES AND TOOLS FOR





Because parts are cut with great precision on Fellows Gear Shapers, wear and breakage of shaving tools is kept to a minimum in shaving operations... resulting in overall economy of production.

segment, and interrupted tooth gears, as well as sprockets, worms, cams, and many other parts.

Write for the 64-page illustrated book of ideas and techniques, "The Fellows Method". The Fellows Gear Shaper Company, Head Office and Export Dept., Springfield, Vermont, U.S.A.—Branch Offices: 616 Fisher Bldg., Detroit 2;—or 640 West Town Office Bldg. Chicago 12.

Fellows

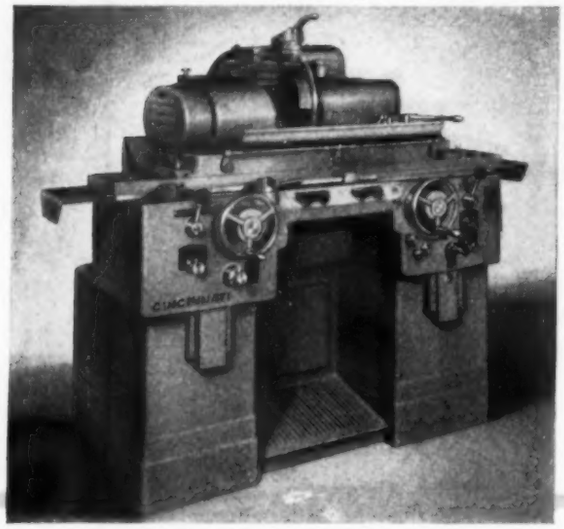
ALL OPERATIONS FROM BLANK TO FINISHED GEAR

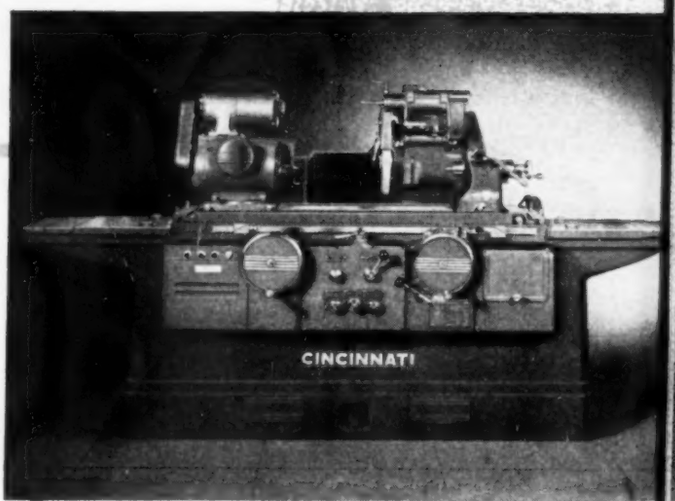
CINCINNATI FILMATIC 10" Plain Hydraulic Grinding Machine. Also available in 14"-L size. Between-center lengths, 18", 36", 48", 72" and 96". Catalogs G-490-2 and G-533-1.

CINCINNATI FILMATIC GRINDERS...

for your precision cylindrical grinding operations

CINCINNATI FILMATIC 4" Plain Hydraulic Grinding Machine. Built in 12" and 18" lengths. Catalog G-551.





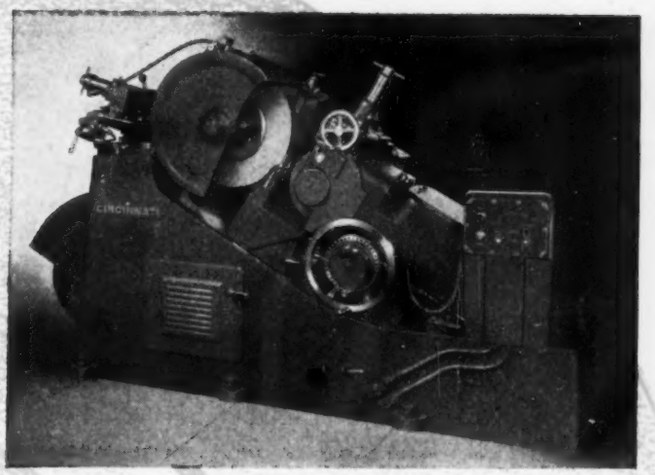
CINCINNATI FILMATIC 12" Hydraulic Universal Grinding Machine. Also available in 14", 16" and 18" sizes, and between-center lengths 36", 48" and 72". Catalogs G-486-4 and G-474-3.

● Industrial sewing machine parts are precision ground on CINCINNATI FILMATIC 4" Plain Hydraulic Grinders... 54" back-up rolls for rolling mills are ground to a mirror finish on CINCINNATI FILMATIC Traveling Wheelhead Roll Grinders. In centerless grinding, the parts ground on CINCINNATI FILMATICS range from balance staffs for clocks to bowling balls. There's a CINCINNATI FILMATIC Grinder for almost any size part you might mention. ¶The centertypes are available in 4", 6", 10", 12", 14", 16", 18", 20", 24", 28", 36", 44", 50" and 60" swing sizes; the centerless in Nos. 2, 3 and 4 (larger and smaller on request) and there is one Centerless Lapping Machine. Brief descriptions of most of these machines will be found in general catalog M-1420-1.

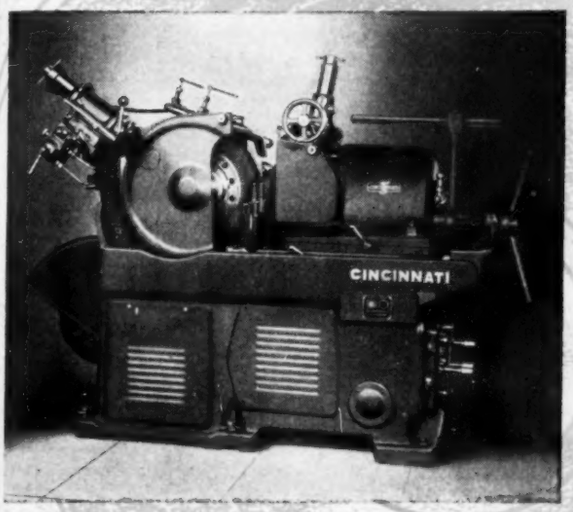
CINCINNATI

CENTER TYPE GRINDING MACHINES

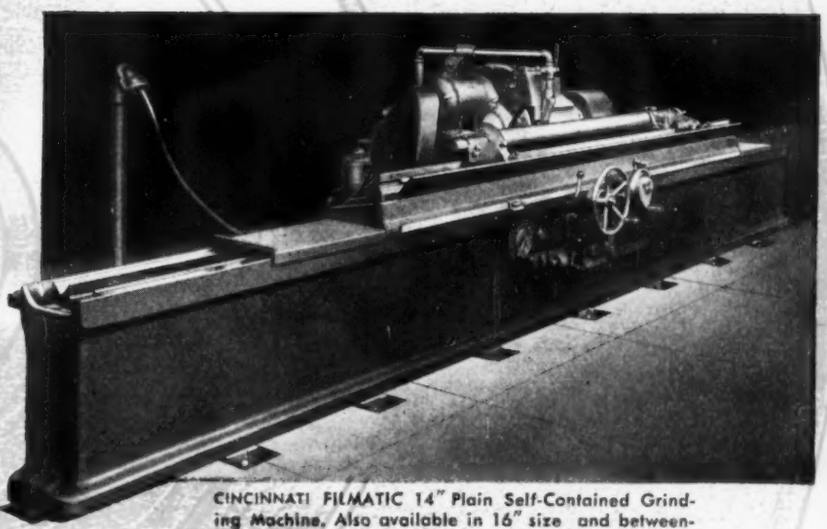
CINCINNATI FILMATIC 6" Plain Hydraulic Grinding Machine. Also available in 10"-L size and between-center lengths 18" and 30". Catalog G-337.



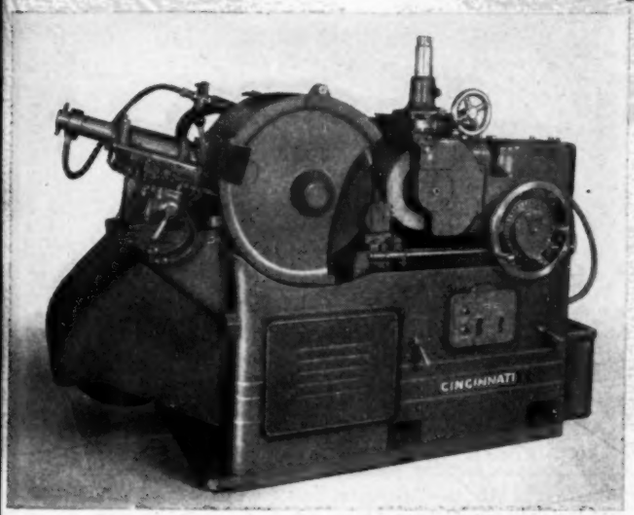
CINCINNATI FILMATIC No. 4 Centerless Grinding Machine. Capacity up to 9" diameter. Catalog G-538.



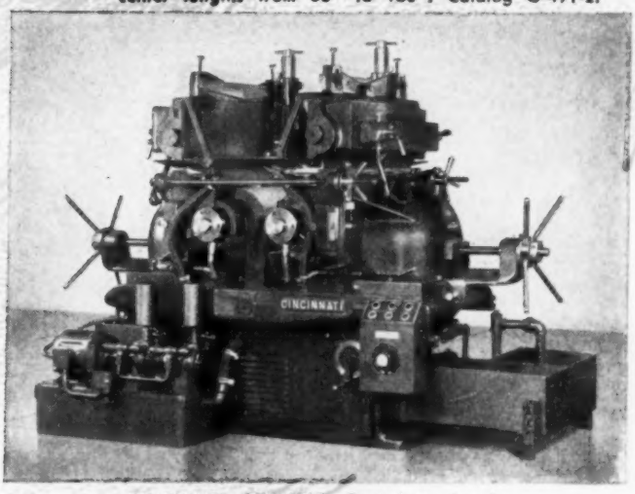
CINCINNATI FILMATIC No. 2 Centerless Grinding Machine. Capacity 1/16" to 3½" diameter. Catalog G-456-4.



CINCINNATI FILMATIC 14" Plain Self-Contained Grinding Machine. Also available in 16" size and between-center lengths from 36" to 168". Catalog G-491-2.



CINCINNATI FILMATIC No. 3 Centerless Grinding Machine. Capacity up to 6" diameter. Catalog G-438-3.



CINCINNATI FILMATIC Centerless Lapping Machine. Capacity ¼" to 3" diameter.

GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CINCINNATI

CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES

ACTUAL SIZE

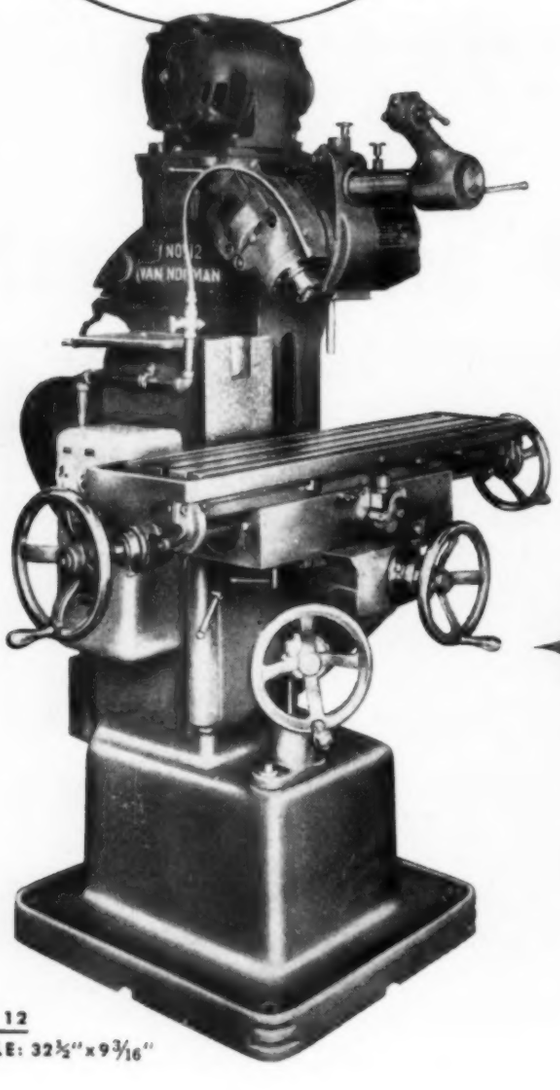
MILL SPRING

TO .0028"

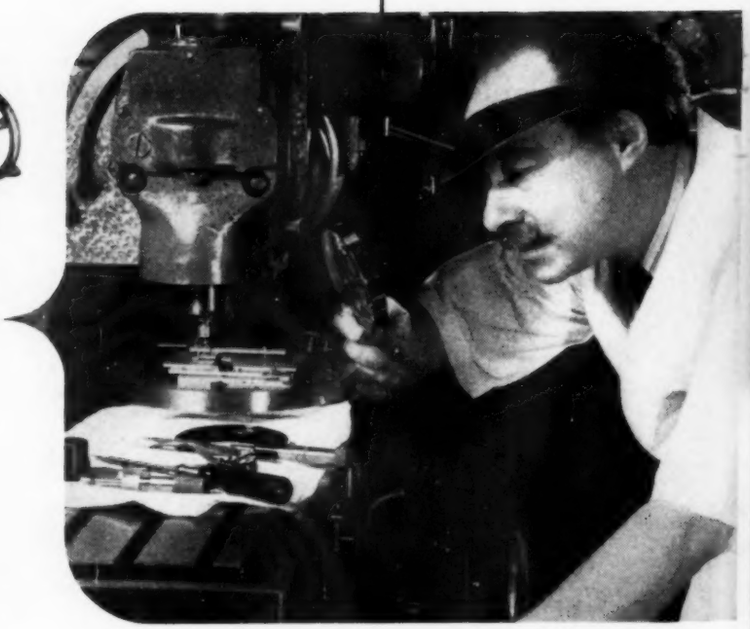
THICKNESS

± .0001"

This Precision Work



NO. 12
TABLE: 32½" x 9 3/16"



With head in vertical position, Mr. V. E. vanHoesen is boring a drill jig. So small and precise is the work that a magnifying glass is used.

FOR PRECISION MILLING

Work so fine and precise that a magnifying glass must be used to perform the milling operations . . . that's typical of accurate work that is done on Van Norman Ram Type Milling Machines. Illustrations below show some of the milling operations performed in making a marine chronometer detent.

Note the facts as stated by Mr. V. E. vanHoesen, watchmaker, A. Graves & Steuwer Company, Memphis, Tenn., who performed the work.

"Inertia and force of the detent spring must be reduced to the very lowest point consistent with its functions, therefore, it is necessary that this spring be extremely thin.

"We milled this spring to a thickness of .0028 inches and were successful . . . in having less than five percent spoilage in this operation and tolerance was easily held within plus or minus .0001 inches.

"On the part made of nickel, width of the shallow lengthwise slot had to be maintained within plus or minus .0001 inches and absolute parallelism was necessary with the face containing the dowel pins.

"As to the small S shaped piece, the fact that this angle bracket fitted into the assembly without dowel pins shows the type of tolerances which had to be maintained here.

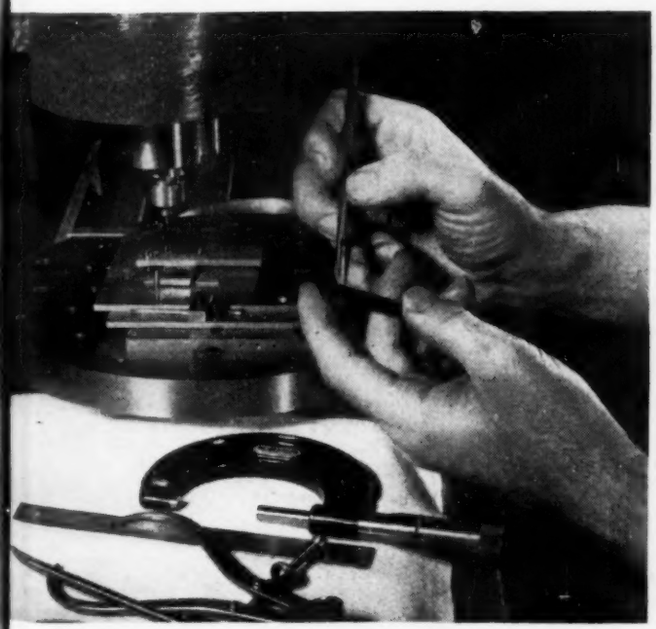
"All drill jigs and milling fixtures for the job were jig-bored on the machine."

In addition to accurate performance, Van Norman Ram Type Millers increase production and cut milling costs. Write for information.

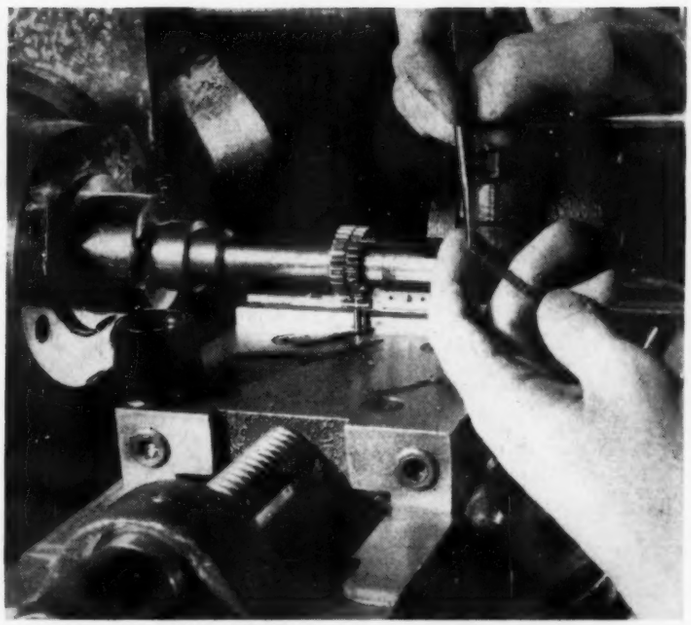
VAN NORMAN COMPANY

SPRINGFIELD 7, MASS.

k Performed on the Van Norman No. 12



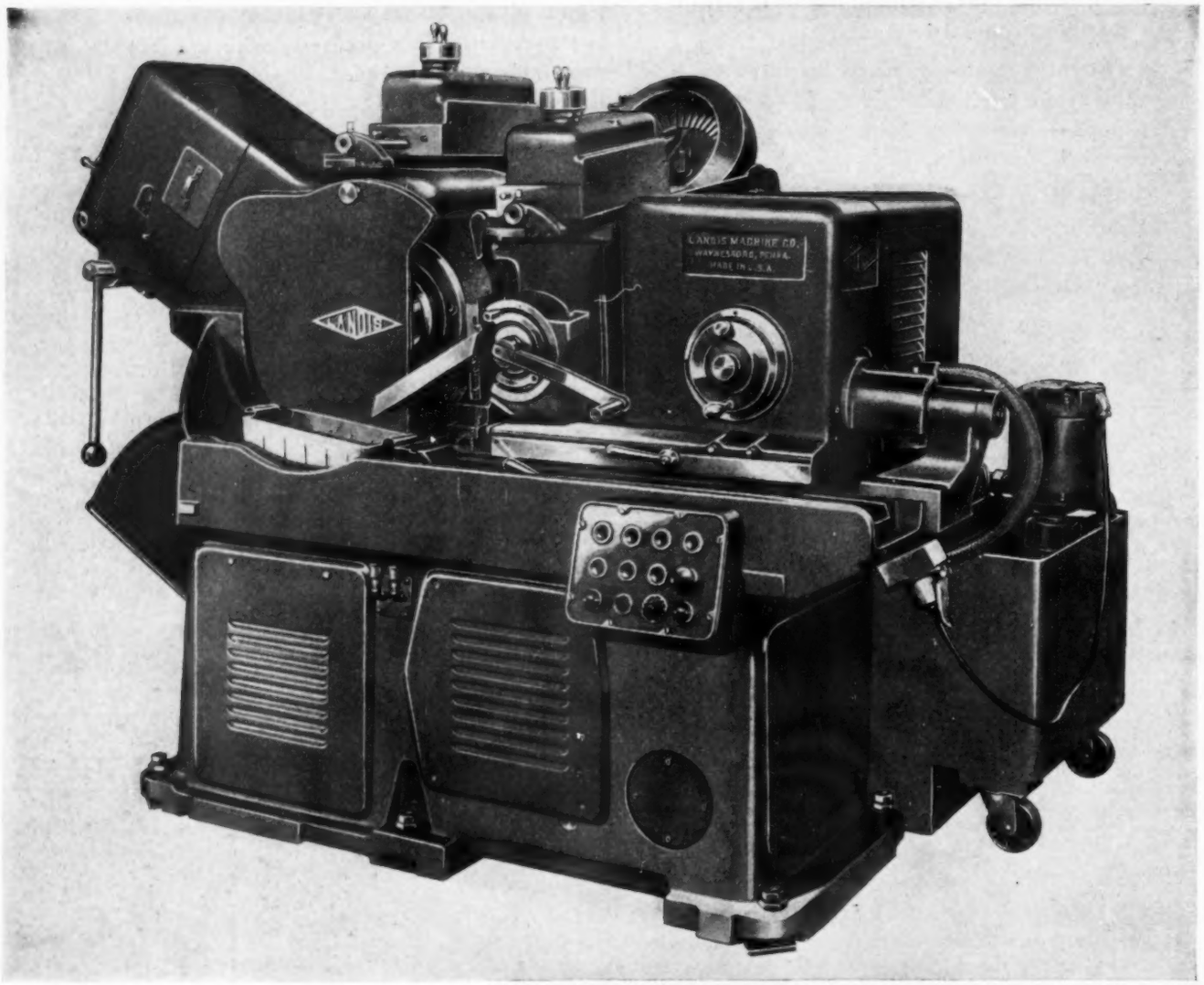
Checking the finished drill jig for accuracy. This is the largest of five jigs used in making the detents.



Operator checks the work piece after taking the horizontal gang milling cut.

. . . "*It Pays to Van Normanize*"

A LANDIS MACHINE FOR EVERY



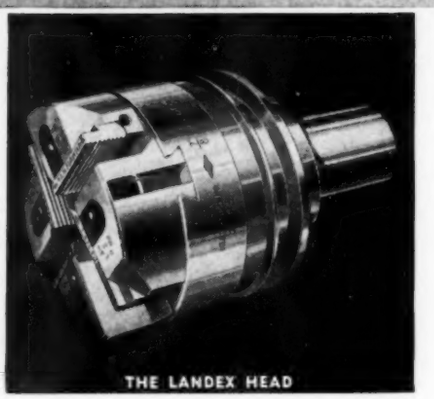
The Centerless Thread Grinder

- **Landis again leads the way in thread production with this revolutionary new grinder designed to grind screw threads on straight cylindrical workpieces as well as on headed or multiple diameter parts.**

LANDIS

THE LANDMATIC HEAD

LANDIS ALT COLLAPSIBLE TAP



THE LANDEX HEAD

THREADING OPERATION

Threading Machinery—Thread Cutting Die Heads—Collapsible Taps—Pipe Threading and Cutting Machines

"The Landis Line" offers machines designed to produce all types of threads. This equipment has gained a world-wide reputation for its precision accuracy and high-speed production. By production men, it is preferred for its economy, long life, and ease of operation.

Landis Die Heads are manufactured in three types, for . . . threading machines . . . automatic screw machines . . . and turret lathes. A suitable die head is available for almost any machine performing thread cutting operations. Landis Collapsible Taps are designed for tapping straight or tapered threads in any machinable material.

The Landis Chaser is famous for its greater accuracy, higher cutting speeds, and longer chaser life. This results from the free cutting condition made possible by the patented design allowing the chaser to operate tangent to the work.

Landis is always alive to threading production problems. Many manufacturers today are using adaptations which have been worked out by Landis engineers to meet their individual manufacturing problems.

LANDIS
REG. U.S. TRADE-MARK PAT. OFF.

AUTOMATIC FORMING & THREADING MACHINE

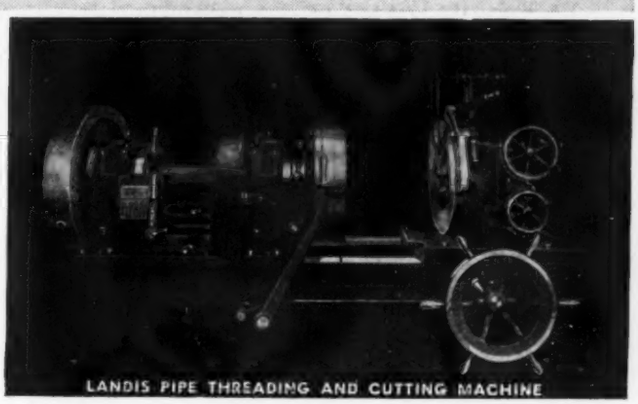
LANDIS 3/8" THREADING MACHINE

LANDMACO THREADING MACHINE

MACHINE CO. WAYNESBORO PENNA. U.S.A.

The LANDIS CHASER

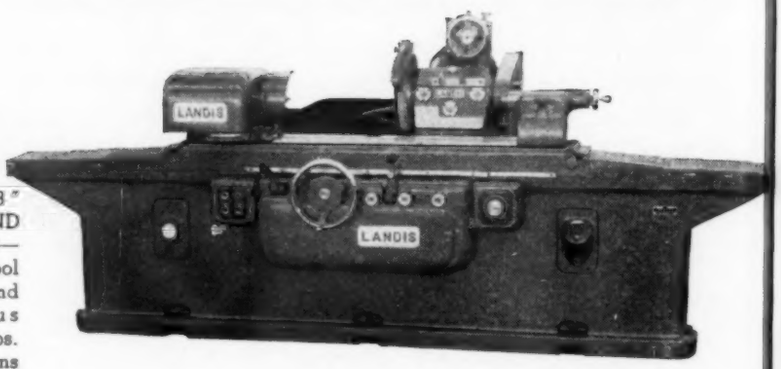
• The Finest Thread-Cutting Tool In Industry


LANDIS PIPE THREADING AND CUTTING MACHINE

Reduce Precision Grinding Costs BY FITTING

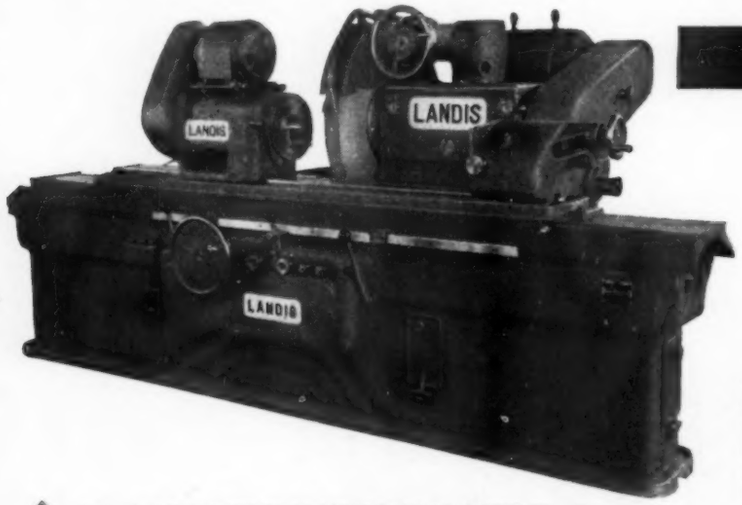
UNIVERSAL GRINDERS

12" x 28" UNIVERSAL AND TOOL GRINDER—For precision tool room grinding and miscellaneous small grinding jobs. Grindingoperations on standard machines: cylindrical, taper, face, surface, clearance on saws, flutes on taps, face of teeth on formed cutters, spiral mills. Usefulness extended by 22 optional accessories. Catalog K45.

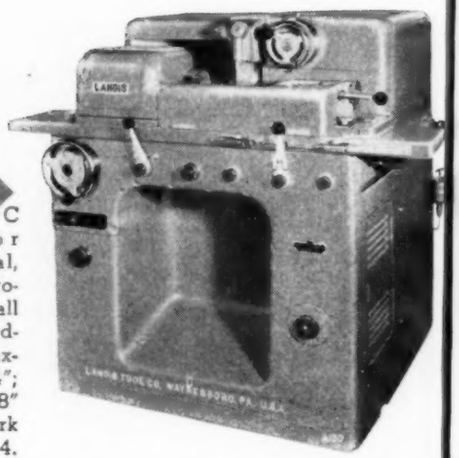


12" LCH HYDRAULIC UNIVERSAL GRINDER—For tool room and production grinding—straight cylindrical, shoulder, taper, face and internal. Maximum work diameter 12"; available in four sizes for work lengths of 30", 36", 40" and 48". Catalog I44.

PLAIN GRINDERS



10"—14" TYPE CH PLAIN HYDRAULIC GRINDER—For straight cylindrical, shoulder, taper and profile grinding of volume production of parts such as: motor armatures, shafts, spindles, crankshaft line bearings, steering knuckles, etc. Maximum work diameters 10" and 14". Available for each in lengths between centers of 18", 36", 48", 72", 96", 120". Catalog B43.



4" TYPE H PLAIN HYDRAULIC GRINDER—For straight cylindrical, shoulder, taper or profile grinding of small light parts not exceeding 1½" diameter. Maximum diameter 4"; available in 12" and 18" lengths between work centers. Catalog A44.

SPECIAL MACHINES FOR SPECIAL JOBS

- Crankshaft Grinding
- Crankshaft Regrinding
- Camshaft Grinding
- Valve Grinding
- Ball Race Grinding
- Roll Grinding

OPTIONAL ADDITIONAL FEATURES and TOOLING FOR HIGH PRODUCTION

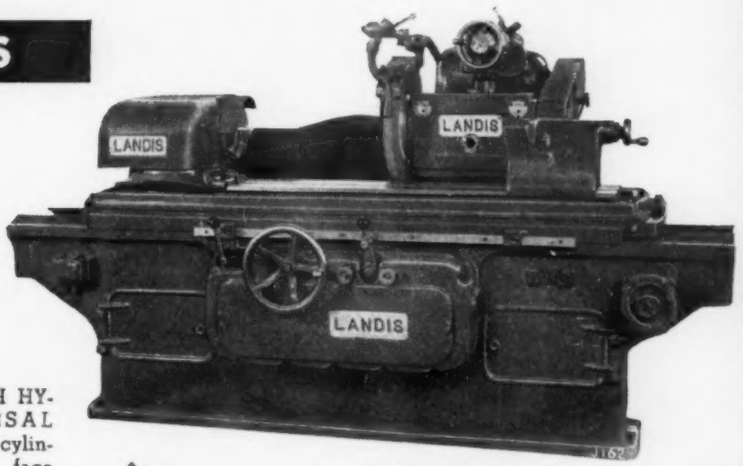
- Automatic Sizing
- Crowning Mechanism
- Hydraulic Footstock
- Hydraulic Rapid Infeed
- Oscillating Headstock
- Reciprocating Wheelbase
- Visual Sizing
- Wheel Dressing Fixtures
- Work Ejectors
- Work Holding Fixtures

LANDIS TOOL COMPANY • WAYNESBORO, PA.

THE MACHINE TO THE JOB

UNIVERSAL GRINDERS

10" x 20" TYPE H HYDRAULIC UNIVERSAL GRINDER—For straight cylindrical, shoulder, taper, face and internal grinding. Ideal for fast production of small tools and precision small parts which require universal features such as face or internal grinding. Catalog I-145.



12" — 14" — 16" — 18" TYPE C HYDRAULIC UNIVERSAL GRINDERS—For straight cylindrical, shoulder, taper, face and internal. For tool room grinding of quantities of gauges, mandrels and boring bars; for production grinding and very fine finishes. Available in three maximum work lengths—36", 48" and 72" for maximum work diameters of 12", 14", 16" and 18". Catalog J242.

CENTERLESS GRINDERS

CENTERLESS THREAD GRINDER—For through feed grinding of threads to high precision in a single pass with a formed wheel.

NO. 12 CENTERLESS GRINDING MACHINE—For through feed straight cylindrical grinding, taper grinding and infeed grinding up to a shoulder. Work diameters 1/16" to 3 1/2". Catalog T44.

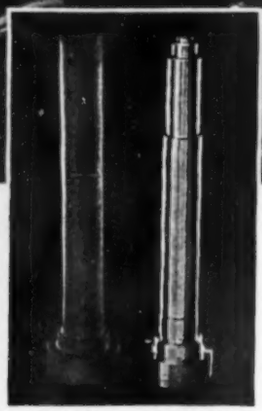
OVER 150 DIFFERENT TYPES OF LANDIS TOOL PRECISION GRINDERS

all available with the exclusive *microsphere wheel spindle bearing* for fine finish and close tolerances and LANDIS TOOL engineered grinding service to help you get the best solution.

LANDIS TOOL
Precision Grinders

MINUTES INTO PROFITS...

20-In. "AMERICAN" Multi-Production Lathe, turning elevating pinion shafts from rough forgings for 40 M.M. anti-aircraft guns.



THIS to THIS
in 18 minutes

This is no stunt! It's a steady production job day in and day out. Total floor to floor time, **18** minutes. Cutting speed, 175'. Feed, .015". Maximum depth of cut, 3/8". Material, S.A.E. 4640 steel—heat-treated.

PRODUCTION EQUIPMENT

Front and rear tool holders. Automatic length stops. Direct reading cross feed dials with indicating clips. Built-in roller bearing tailstock center. This is the kind of performance that transforms minutes into profits.

THE AMERICAN TOOL WORKS CO.
Cincinnati, Ohio, U. S. A.
Lathes and Radial Drills

FOR IMMEDIATE DELIVERIES

Now COVEL NO. 22

A UNIVERSAL CUTTER AND TOOL GRINDER *equipped with All-Electric Power Table Traverse and Wet Grinding Attachments*

ALL-ELECTRIC POWER TABLE TRAVERSE . . . Power from individual reversing motor drives through 3-step cone pulleys (V-belt) to gear case and through 2-step pulleys from gear case to table mechanism. Six various speeds available. All-electric system assures smooth, rapid table traverse. No clutches to wear out.

COMPLETE WET GRINDING ATTACHMENTS . . . Splash guards, pump, piping and tank for coolant are available to completely equip the 22 for wet grinding. Tank mounted on casters for easy handling and cleaning.

COVEL MANUFACTURING CO.
BENTON HARBOR, MICHIGAN

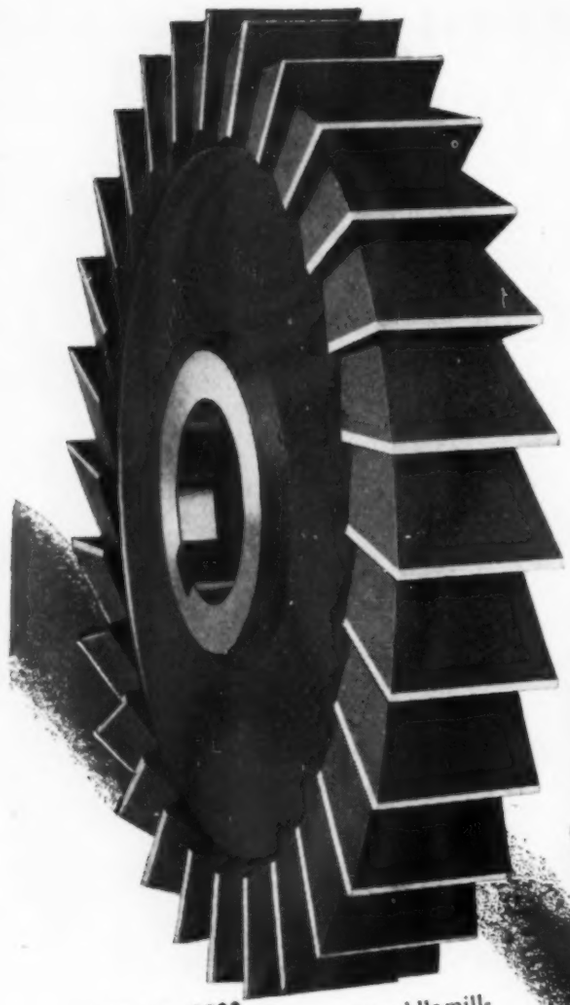
THE term *Universal* acquires a new significance when applied to the Covel No. 22 Universal Cutter and Tool Grinder. It's rugged, accurate and dependable. It's easy to set up, simple in operation and readily adaptable for fast grinding on a wide variety of jobs.

That's why tool men who need more capacity at lower costs are ordering the No. 22 Universal. We are making *immediate* deliveries from stock — *now!* Write for bulletin No. A-27 or see your nearest Covel dealer.

COVEL
INDUSTRIAL GRINDERS

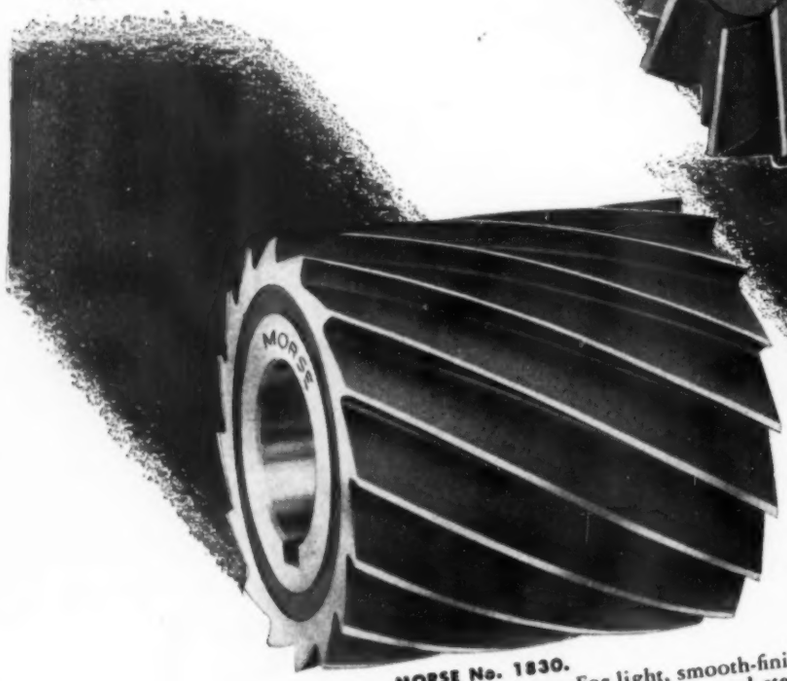
MORSE

that

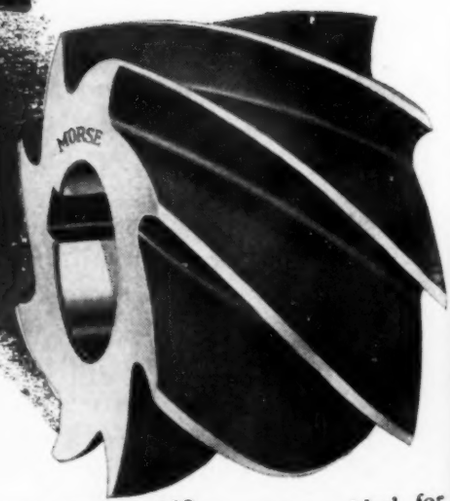


MORSE No. 1833.
Side Milling Cutter—For general straddle milling, slotting, and side milling.

MORSE No. 1809.
Alternate Tooth Side Milling Cutter—For deep slotting, keyway, and heavy-duty milling. Teeth of alternate right and left hand spiral provide shearing action and eliminate side thrust. Cutting action is smooth and rapid.



MORSE No. 1830.
Plain Milling Cutter—For light, smooth-finish cuts in cast iron, malleable iron, and steel. For slabbing work which is narrower than the cutter.



MORSE No. 1802.
Heavy-Duty Plain Milling Cutter—Ideal for heavy cuts where considerable stock is to be removed.

Makes the Cutters

Make the Most of Time

Morse Milling Cutters are designed to make the most of time by giving *maximum* performance on each job. The result of over 80 years of experience, Morse Cutters are noted for their *consistently long life, smoothness of cut,* and *high return per sharpening.*

Milling Cutters of all kinds are available from Morse. Besides those shown, Morse can supply you with Angle, Convex and Concave Cutters, Woodruff Keyseat and Involute Gear Cutters, as well as any of the other high quality cutting tools in the complete Morse line—End Mills, Reamers, Taps, Dies, and Drills.

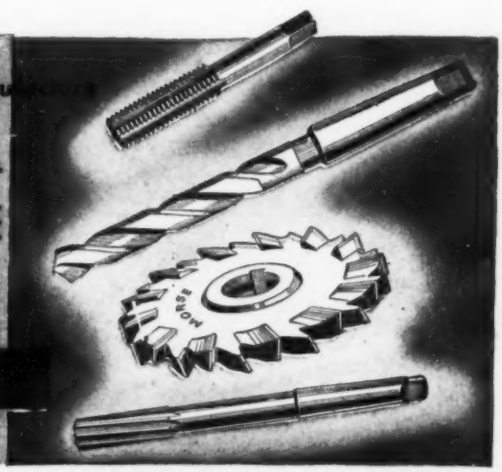
Maximum Cutter performance depends upon many factors and only when *all* these are known can the proper Cutter be selected. You can derive the benefit of our experience by letting Morse help you in the selection of the proper Cutter for *your* job. Your Industrial Supply Distributor will cooperate in securing a Morse recommendation.

Accuracy, Quality, Uniformity: the MORSE Code of Cutting-Tool Manu

MORSE TWIST DRILL & MACHINE COMPANY

The Original Manufacturer of Twist Drills

NEW BEDFORD, MASSACHUSETTS



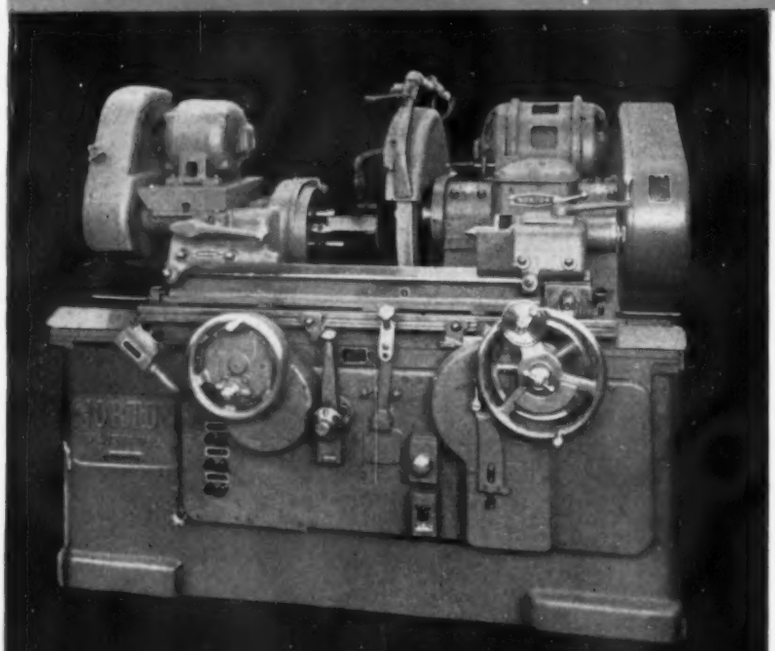
NEW YORK STORE: 130 LAFAYETTE ST. • CHICAGO STORE: 570 WEST RANDOLPH ST. • SAN FRANCISCO STORE: 1180 FOLSOM ST.

For High Precision on a High Production Basis...

4" TYPE C GRINDER

The 4" Type C Machine, available in 12" and 18" lengths, is sturdy and compact — designed for turning out small cylindrical work in diameters up to 2". Extreme accuracy is maintained at a high rate of production. Work speeds range from 100 to 1000 r.p.m.

A new catalog, Form 287, gives complete details.



10" TYPE C GRINDER

This grinder is excellent for work such as large shafts, camshaft main bearings and various engine parts. Constructed for the operator's convenience. Wherever operated, this machine has met every demand for improved finish and increased precision. Built in 18", 36", 48", 72", 96" and 120" lengths.

Form 2288 gives full information about the standard machine and Form 1367 about the semiautomatic.

NORTON GRINDERS *and Lappers*

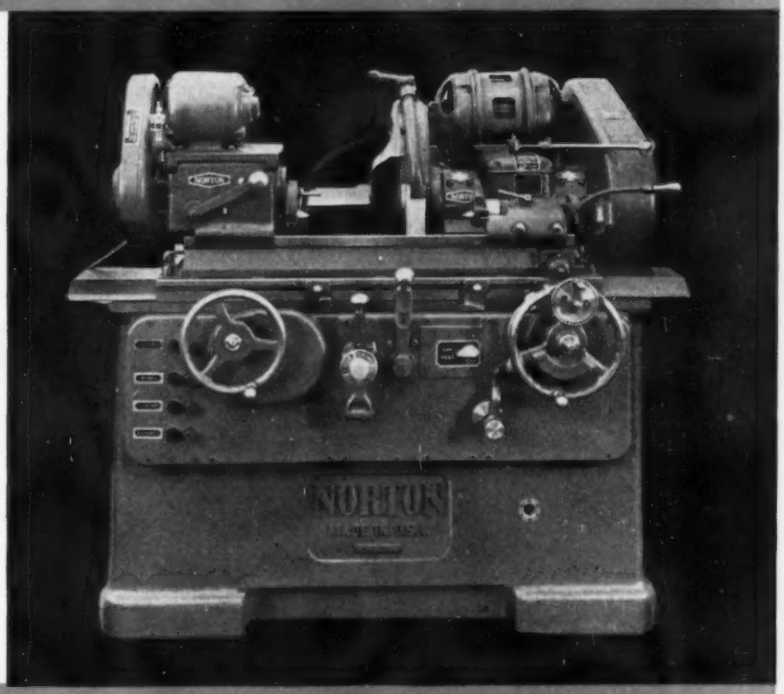
NORTON COMPANY, WORCESTER 6, MASS., U. S. A.

NORTON CYLINDRICAL GRINDERS

6" TYPE C GRINDER

An ideal machine for small center type operations in small or large quantities, giving a high rate of efficiency. This grinder, and also the 4" and the 10" can be furnished with semiautomatic arrangements which increase output, reduce work cost and save time.

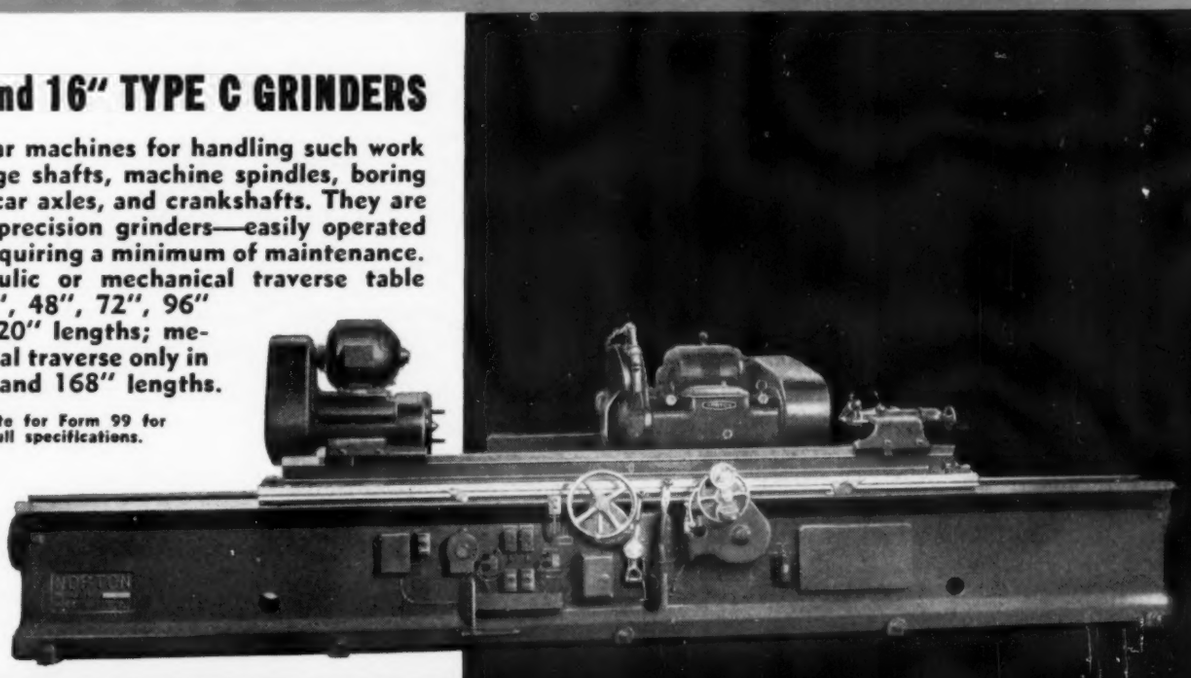
Specification details on the standard grinder given in Form 379, and on the semiautomatic in Form 243.



14 and 16" TYPE C GRINDERS

Popular machines for handling such work as large shafts, machine spindles, boring bars, car axles, and crankshafts. They are large precision grinders—easily operated and requiring a minimum of maintenance. Hydraulic or mechanical traverse table in 36", 48", 72", 96" and 120" lengths; mechanical traverse only in 144" and 168" lengths.

Write for Form 99 for full specifications.

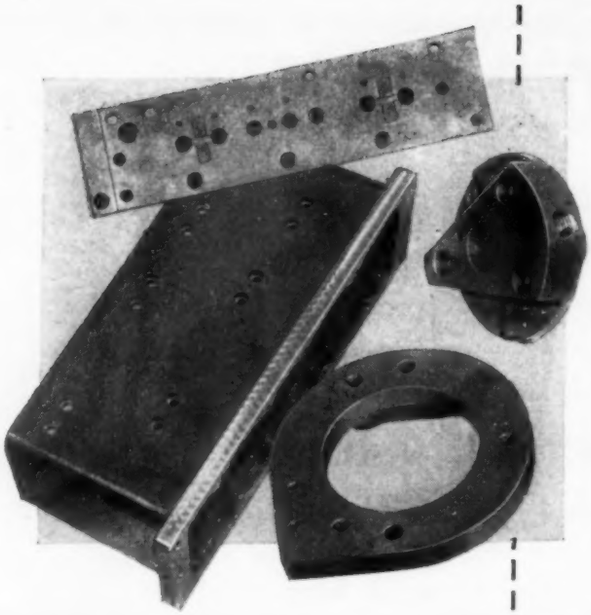


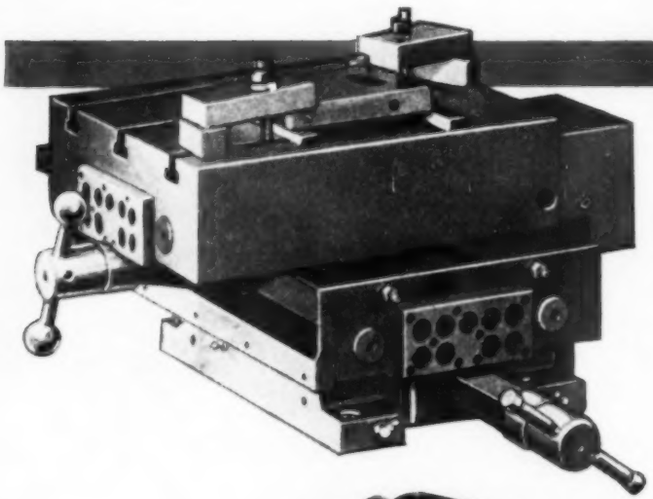
NORTON GRINDERS and Lappers

HARTFORD • NEW YORK • CLEVELAND • DETROIT • CHICAGO • Distributors in all Principal Cities

Now... you can drill, bore, ream or tap pieces like these

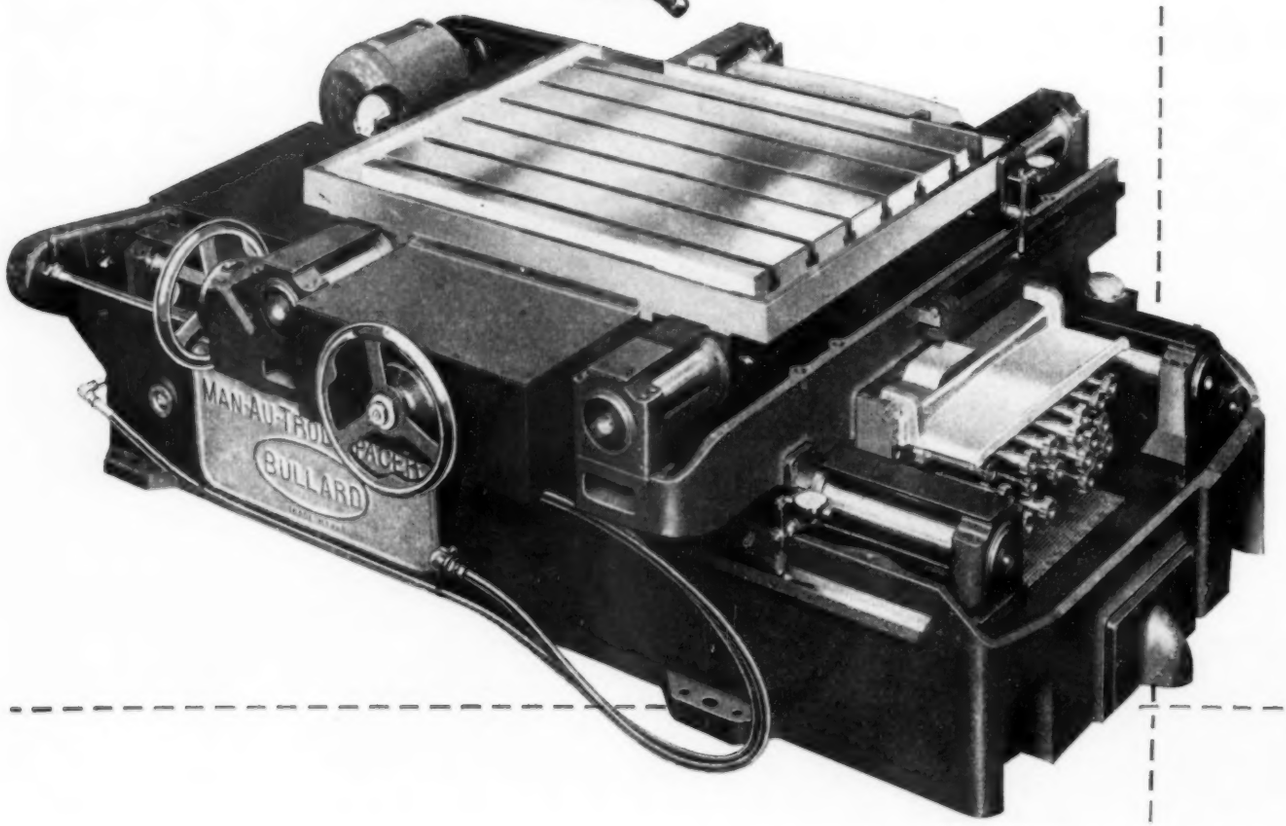
Actual work produced by Bullard MAN-AU-TROL Spacers without the use of jigs.





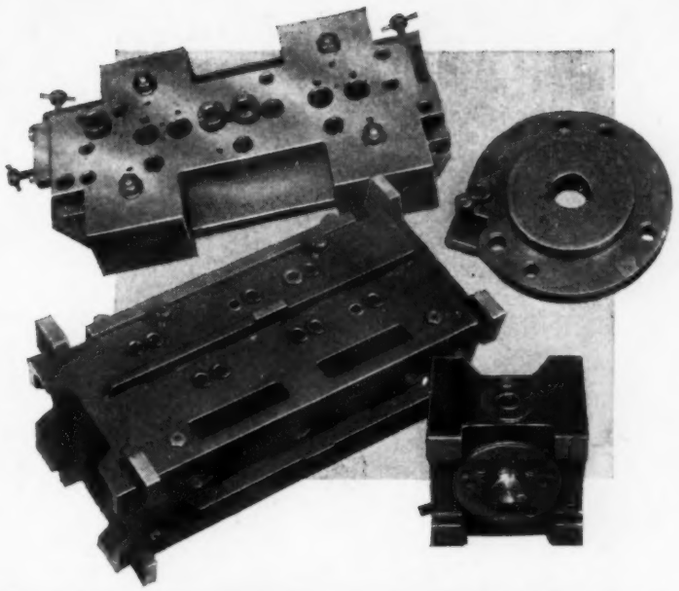
...with Bullard Man-Au-Trol Spacers

4" x 4" Spacer for use with smaller sensitive drills. 30" x 20" Spacer for use with radial drills.



...and eliminate jigs like these

These cumbersome, costly jigs were formerly used to produce the pieces shown on the left.



New Bullard Man-Au-Trol Spacers Speed Production... Reduce Costs

With these semi-automatic positioning tables replacing most of your hole-locating jigs, men and machines that used to be tied up on jig fabrication can join your production line.

With the cost of designing, making, handling, repairing and storing jigs just about eliminated, your competitive position takes a turn for the better.

All the details about the way this *New Bullard Method* repeats any pattern of holes to speed production, reduce manufacturing costs, lessen operator fatigue, are contained in the new MAN-AU-TROL Spacer Bulletin.

Write for a copy today. The Bullard Company, Bridgeport 2, Connecticut.

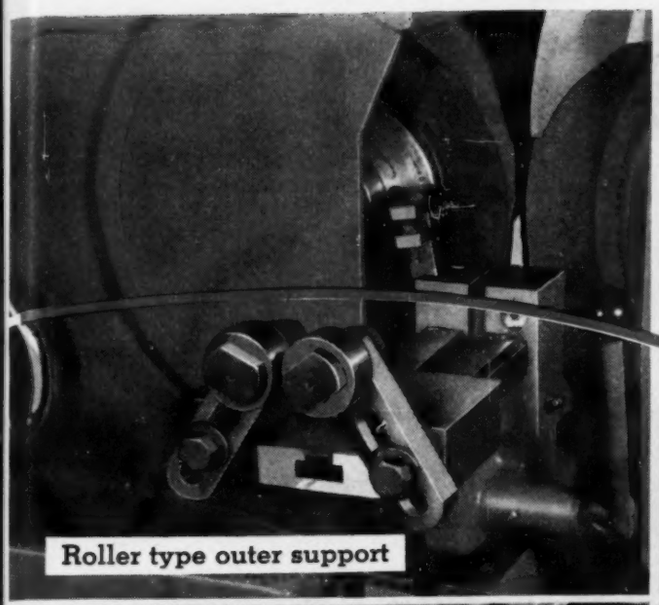
BULLARD

CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

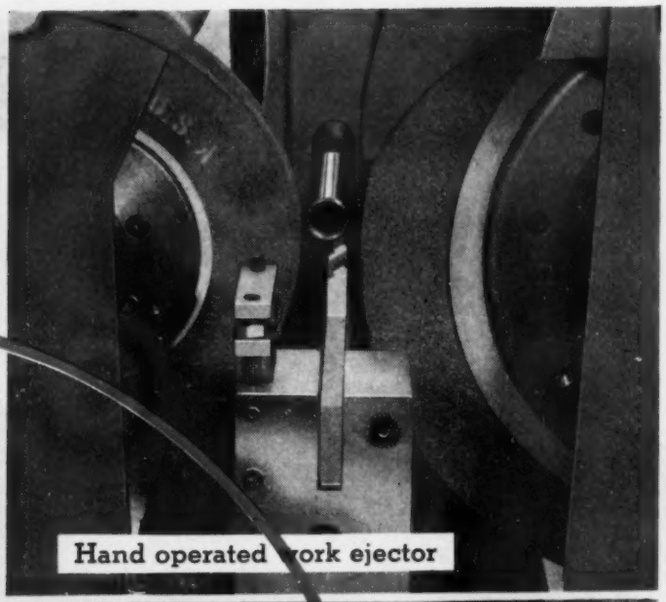
Special Fixtures Speed Output

of LANDIS TOOL centerless grinder

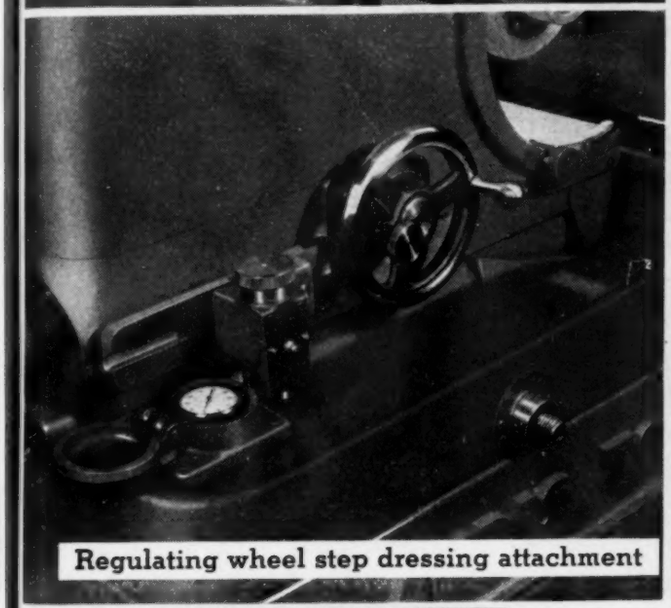
LANDIS TOOL
Precision Grinders



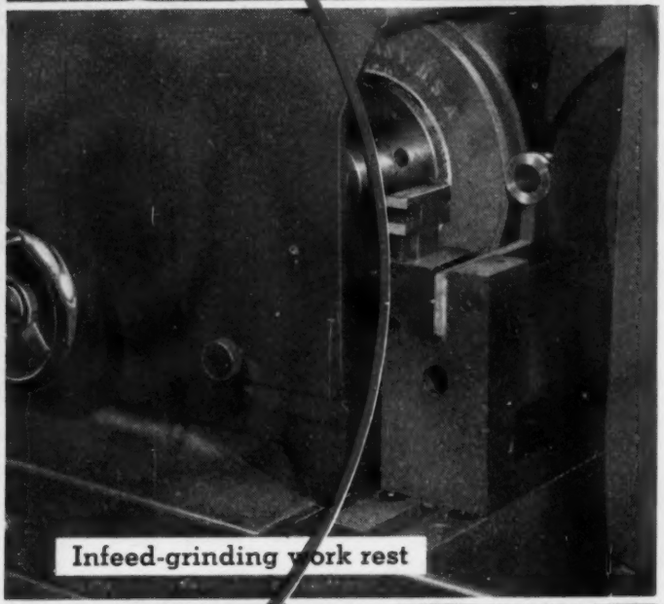
Roller type outer support



Hand operated work ejector

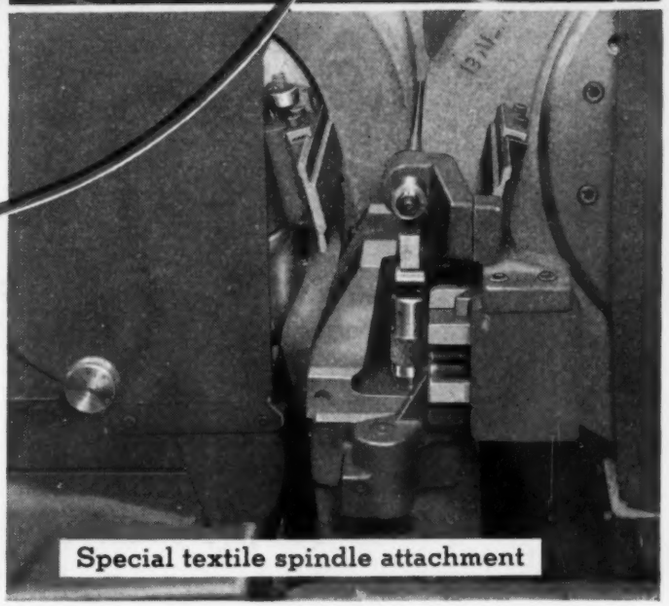


Regulating wheel step dressing attachment



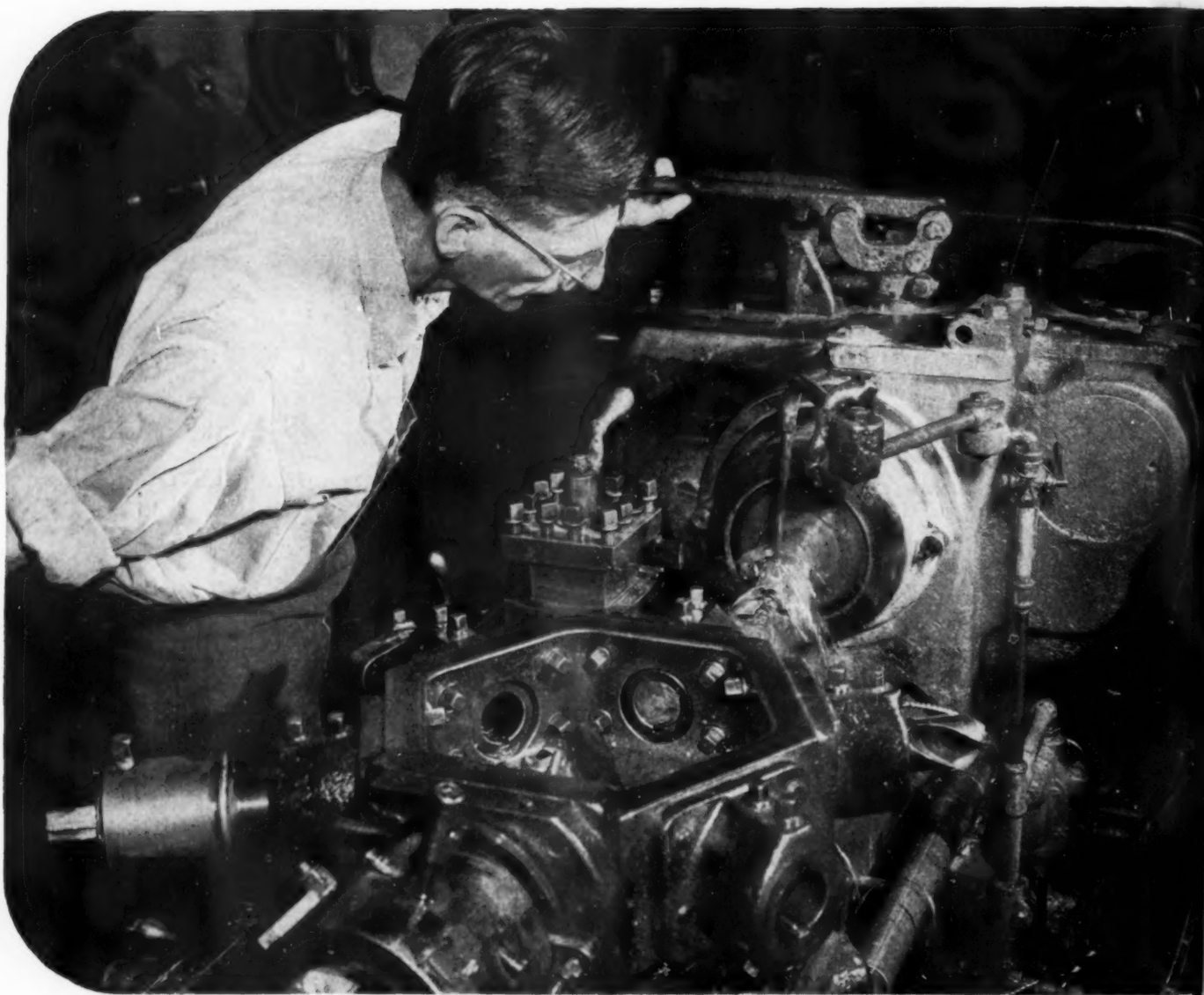
Infeed-grinding work rest

Bar grinding attachment



Special textile spindle attachment

No guesswork about



This Warner & Swasey 1-A Turret Lathe has a 15-year record of high production with low maintenance cost. *Finish and concentricity of parts used in Leeds & Northrup electrical instruments are of utmost importance. The turning operation shown here on a Thermo Couple Well calls for tapping, bore drilling and taper turning. Material used is KA 2 18-8 stainless steel.*

at this plant
Maintenance costs

The **LEEDS & NORTHRUP CO.,** Philadelphia, Penna., manufacturers of electrical measuring and control instruments, figure all items of maintenance cost right down to the penny. The maintenance system for machine tools at this company is recognized as being one of the most thorough in industry. Complete, accurate records are kept of repairs, replacement parts, labor and down time for every machine from the time it is installed until it is replaced.

With such extensive maintenance controls, machine tools that are becoming inefficient—whose maintenance and operating costs are approaching their productive worth—can be quickly spotted and replaced.

It is significant that under this system four Warner & Swaseys have been retained in service for long periods. For example, the Warner & Swasey 1-A Universal Turret Lathe pictured at the left, *has been kept in operation for 15 years—for 5 years of that time on two 8-hour shifts and for 5 years on two 10-hour shifts—and is still maintaining high production and close accuracy.*

When you buy a Warner & Swasey Turret Lathe, your investment pays dividends in accurate, fast production and long, trouble-free operating life.

Micromax Pyrometers made by Leeds & Northrup play an important part in the making of iron and steel, chemicals, ceramics, oils, etc. The instruments shown in the picture automatically control temperatures in heat-treating furnaces of the Eastern Malleable Iron Co. Many of the extremely accurate parts used in Micromax Pyrometers and other electrical measuring and control instruments, are turned to close tolerances by Warner & Swasey Turret Lathes.

You can Machine it Better, Faster, for Less.. with a Warner & Swasey

WARNER & SWASEY
Machine Tools
Cleveland

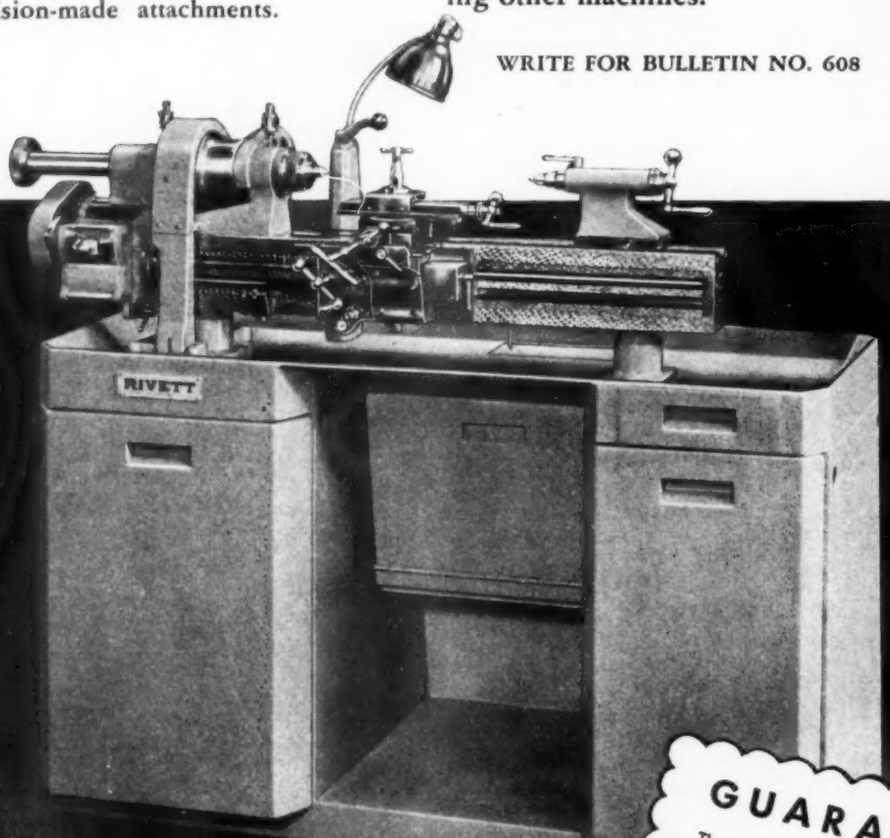
ON *One* PRECISION LATHE DO ALL THIS AND IN LESS TIME . . .

- BALL TURNING
- SPIRAL CUTTING
- MILLING
- GRINDING
- MULTIPLE OPERATIONS
- RELIEVING
- SLOTTING
- FORMING
- TAPER TURNING

All possible through precision-made attachments.

The Rivett No. 608 back-geared, screw cutting lathe for tool making and instrument shops, handles an endless variety of jobs in minimum time. This small but exceedingly proficient lathe with slide areas equal to that of one twice its size, permits the operator to finish his work completely without employing other machines.

WRITE FOR BULLETIN NO. 608



GUARANTEE

The Rivett 608 will turn or bore within 0.0001" in six inches — work held in collet, and turn between centers within 0.0001" in six inches. It will face to eight inches diameter within limit of 0.0002" concave, 0.0000" convex. It will cut threads within 0.0005" in twelve inches, or within 0.0003" in any three inches, or within 0.0002" in any inch of a specimen piece.

RIVETT LATHE & GRINDER INC.

BRIGHTON, BOSTON, MASS., U. S. A.

Already a Sensation—

32 Alundum Grinding Wheels

THE ability of 32 ALUNDUM wheels to cut grinding costs is creating a sensation in shop after shop. And there are definite reasons for their outstanding performance:

32 ALUNDUM Wheels are Sharper

By a patented Norton electric furnace process the grains of "32" form as single crystals of correct size — each one with a nubbly surface and many sharp points. And there's no crushing operation to produce flat surfaces. When the grains of 32 ALUNDUM abrasive are bonded into a wheel there are always many sharp points exposed.

There's More Usable Abrasive in 32 ALUNDUM Wheels

32 ALUNDUM abrasive is over 99% pure fused alumina—no slag—no pores. You not only get *more* sharp cutting points in a 32 ALUNDUM wheel but points that don't dull easily because they're all *usable* abrasive.

Ask your Norton abrasive engineer to give you a Vectograph demonstration of the new 32 ALUNDUM abrasive.

NORTON COMPANY, WORCESTER 6, MASS.

Distributors in All Principal Cities

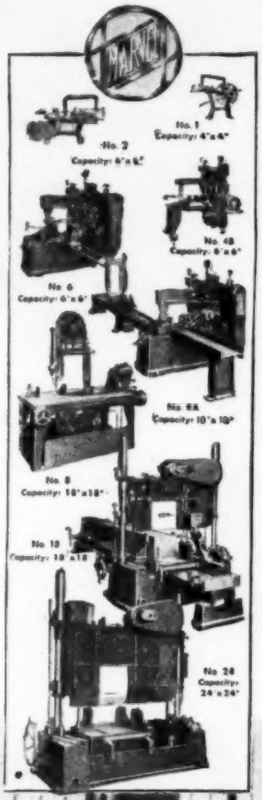
W-1078

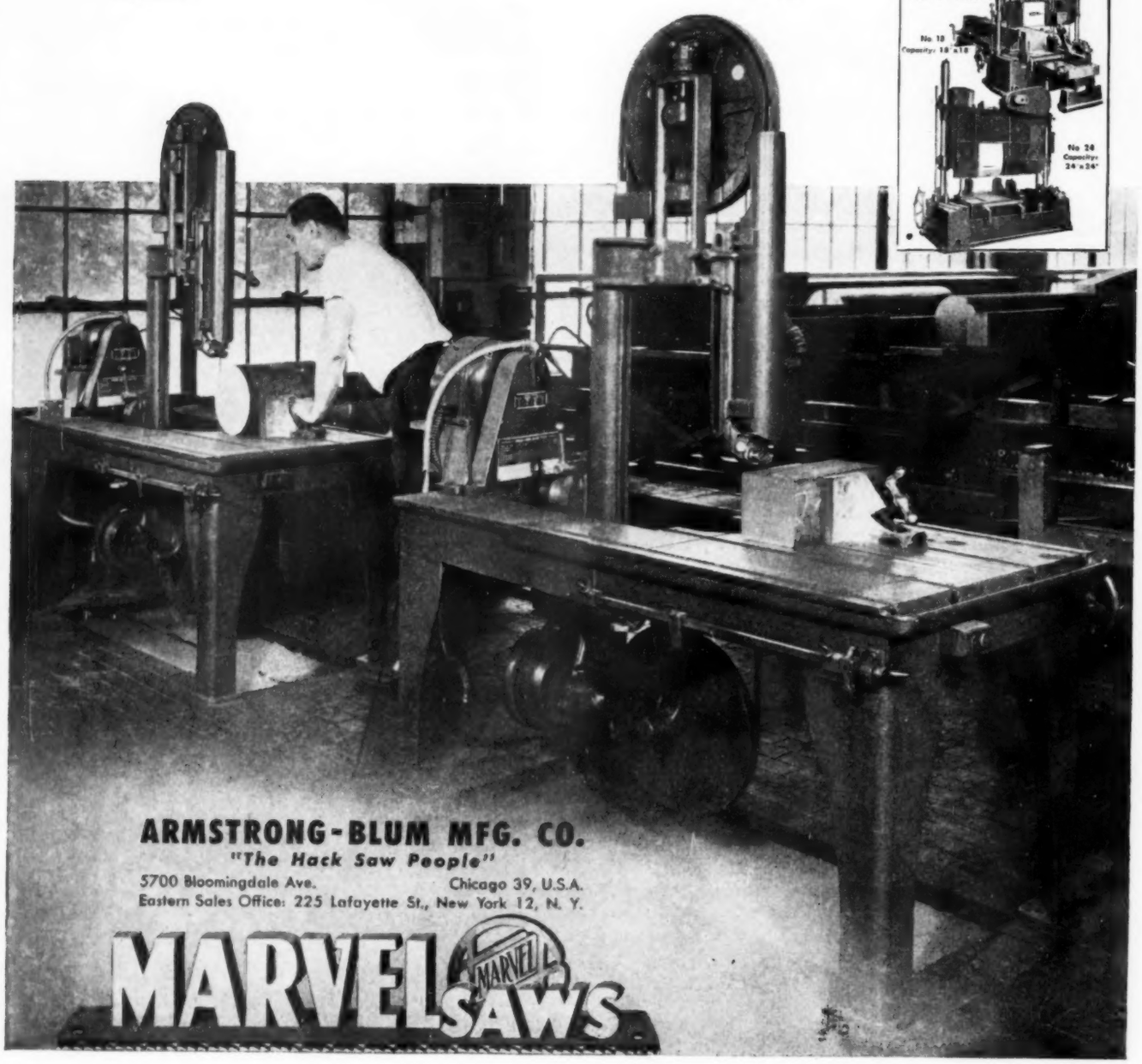
NORTON ABRASIVES

Latrobe Electric Steel Warehouses MARVEL No. 8 Band Saws are Used

Not only in all Latrobe warehouses but at the mill too, MARVEL No. 8 metal-cutting Band Saws are used to cut expensive Tool and Alloy Steels accurately to specification. There are many reasons why the Latrobe Electric Steel Co. has standardized on the universal MARVEL No. 8. It is the most universal saw built—will cut the smallest pieces as well as the largest work up to 18" x 18" with equal accuracy, will cut at any angle, etc. . . . and, is easily operated and practically trouble-proof.

There is a MARVEL Saw for every need and budget. A local MARVEL Field Engineer will gladly discuss your problem with you, recommend the most suitable saw and demonstrate a MARVEL Saw in your vicinity. Consult your classified phone book or write us for address of nearest MARVEL Field Engineer.





ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5700 Bloomingdale Ave. Chicago 39, U.S.A.
Eastern Sales Office: 225 Lafayette St., New York 12, N. Y.

MARVEL SAWS

LONG LIFE AND VIGOROUS GROWTH DEPEND ON SPECIAL TOOLS

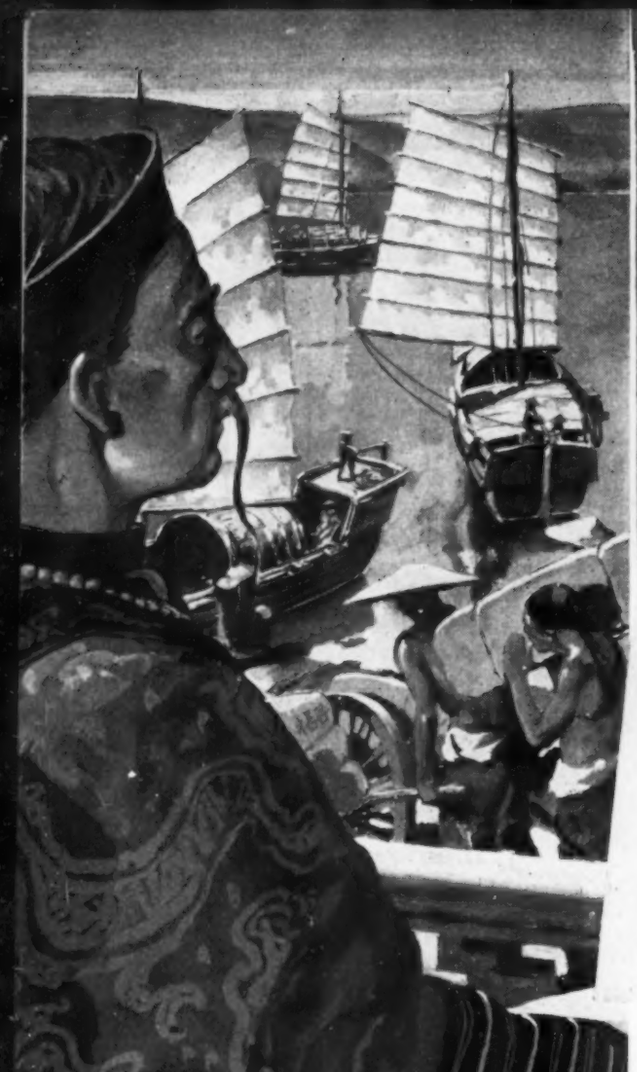
Our scientists now know why the redwood tree is the sole species that has survived all the glaciers, fires, upheavals, and terrific forest competition since the dinosaur age. The redwood became, and remains, a giant because it *creates its own special tools* such as rot proofing and fire resistant chemicals, termite killers, mold resisters, and alkaline soil correctors.

Business life and growth likewise often depends upon designing and building special tools to meet terrific competition. In the past 30 years Vulcan Tool Company has built up an imaginative organization, mentally and physically equipped to give you the same creative tooling service it has so well performed for many other industrial sequoias.

THE *VulcanTool* CO.

730 LORAIN AVE. DAYTON 10, OHIO

ENGINEERING • PROCESSING • DESIGNING • BUILDING
SPECIAL TOOL AND MACHINERY MANUFACTURING



Accidents happen...

Chen Wai Sze was quiet amidst the babble of voices in the old tea house beside the river.

The merchants were gathered, as was their custom, to exchange the day's news of their boats carrying precious cargo to distant cities.

Gravely old Chen listened as the merchants spoke courteous commiserations to the luckless one whose boat had capsized in the treacherous rapids, whirling to destruction the wealth accumulated through years of labor.

At last Chen spoke. "My honored brothers: the grass by the river bank is green, thick are the willow trees, always hungry are the rapids of the river. And fear of utter loss is constant in our hearts.

"Let us then bring our boats together. Let each of us place in each boat a small portion of his cargo. Thus when a boat must satisfy the maws of the river, each of us will lose a little, but none of us will lose his all."

So it was that the merchants shared the chances of loss on the great river that flows forever to the sea.

How EMPLOYERS MUTUALS of Wausau help you to keep ... forever ... part of all you earn

The difference between income and expenditures is yours to keep—forever—*if you protect it.*

That is the purpose of insurance—to protect the assets of a business or an individual.

If you take a chance that disaster will not strike you or your business, you may save a little. But disaster does strike someone—hour after hour, day after day.

Through Employers Mutuals, more than a hundred thousand policyholders share their chances of loss. Each pays his small share of the total cost; each gains protection against disaster.

What are your chances of loss today?

If you are an employer: one out of every 25 men and women employed this year will be killed or seriously injured in accidents at work.

If you drive, or your employees drive: one out of every 28 motor vehicles will kill or seriously injure a man, woman, or child this year. Hundreds of thousands of drivers will have accidents involving property damage. This damage alone will total over $600,000,000. How much could you afford to pay for one of these accidents?

Wherever you live: there will be a fire in one out of every 100 dwelling places this year, at an average cost of $325.61 per fire.

EMPLOYERS MUTUALS of WAUSAU

.....make Insurance

EMPLOYERS MUTUAL LIABILITY INSURANCE COMPANY OF WISCONSIN *Established 1911*

EMPLOYERS MUTUAL FIRE INSURANCE COMPANY *Established 1935*

are waiting to Somewhere...all the time

Employers Mutuals Service helps keep them from happening to you!

EVERY day of the year accidents kill 260 people and seriously injure 28,100 more—at home, at work, on streets and highways. The total cost is well over a million dollars a day.

Tonight hundreds of thousands of men are with their families—men who would not be there except for the outstanding achievements of Employers Mutuals engineering service in reducing accidents and saving lives.

The outstanding reputation of Employers Mutuals for accident prevention began many years ago. Back in 1911, in Wisconsin, a group of farsighted manufacturers decided to share their chances of loss in order to lower the actual cost to each of them. That was the start of Employers Mutuals—the beginning of a story of service.

Because accidents kept the cost of insurance high, they put safety engineers on the job to wipe out the causes of accidents and to devise safer methods of working. Then came industrial nursing, first aid programs, and modern physiotherapy laboratories.

Employers Mutuals service followed the needs of the policyholders. When one needed service in Michigan, Employers Mutuals obtained a charter to operate there. Another policyholder wanted coverage in New York, then in Texas. Again Employers Mutuals went along. Today they are represented in all 48 states.

Large business organizations insure with Employers Mutuals

Thousands of important companies place their insurance with Employers Mutuals because they have made it their business to investigate the sound administration, outstanding service, and reduced accident rates that mean lower insurance costs.

It is equally good business for you to insure with Employers Mutuals.

It is sound business for you to enjoy the same advantage of Employers Mutuals safety work, the prevention of accidents—no matter where they may be waiting for you—and the consequent lower insurance costs. Use the coupon to get information about the policies you may need.

Clip and Mail Coupon Today

Understandable

HOME OFFICE:

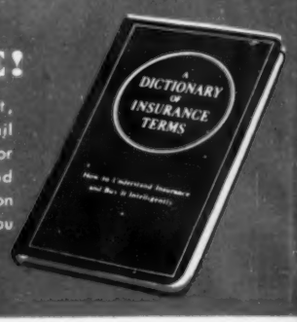
WAUSAU, WISCONSIN

How Employers Mutuals Make Insurance Understandable

Employers Mutuals have always endeavored to make insurance understandable, through their representatives, and through the E-M Insurance Survey. Now they are furthering this endeavor through informative advertising and by the publication of "A Dictionary of Insurance Terms—How to Understand Insurance and Buy it Intelligently." This dictionary, with more than 200 definitions, and many specific examples, is yours for the asking.

FREE!

Just fill out, clip, and mail the coupon for your copy, and for information on policies you may need.



Check the Coverages in which you are interested

- Automobile ☐
- Burglary ☐
- Comprehensive Protective Policy ☐
- Fidelity Bonds ☐
- Fire ☐
- Extended Coverage ☐
- Group Health, Accident, Hospitalization ☐
- Tornado ☐
- Boiler & Machinery ☐
- Public Liability ☐
- Workmen's Compensation ☐

Others:.....

.....

Insurance Information Bureau,
Employers Mutuals of Wausau,
Wausau, Wisconsin.

Please send me, free, "A Dictionary of Insurance Terms" and information on the insurance checked, for:

☐ Business ☐ Personal protection.

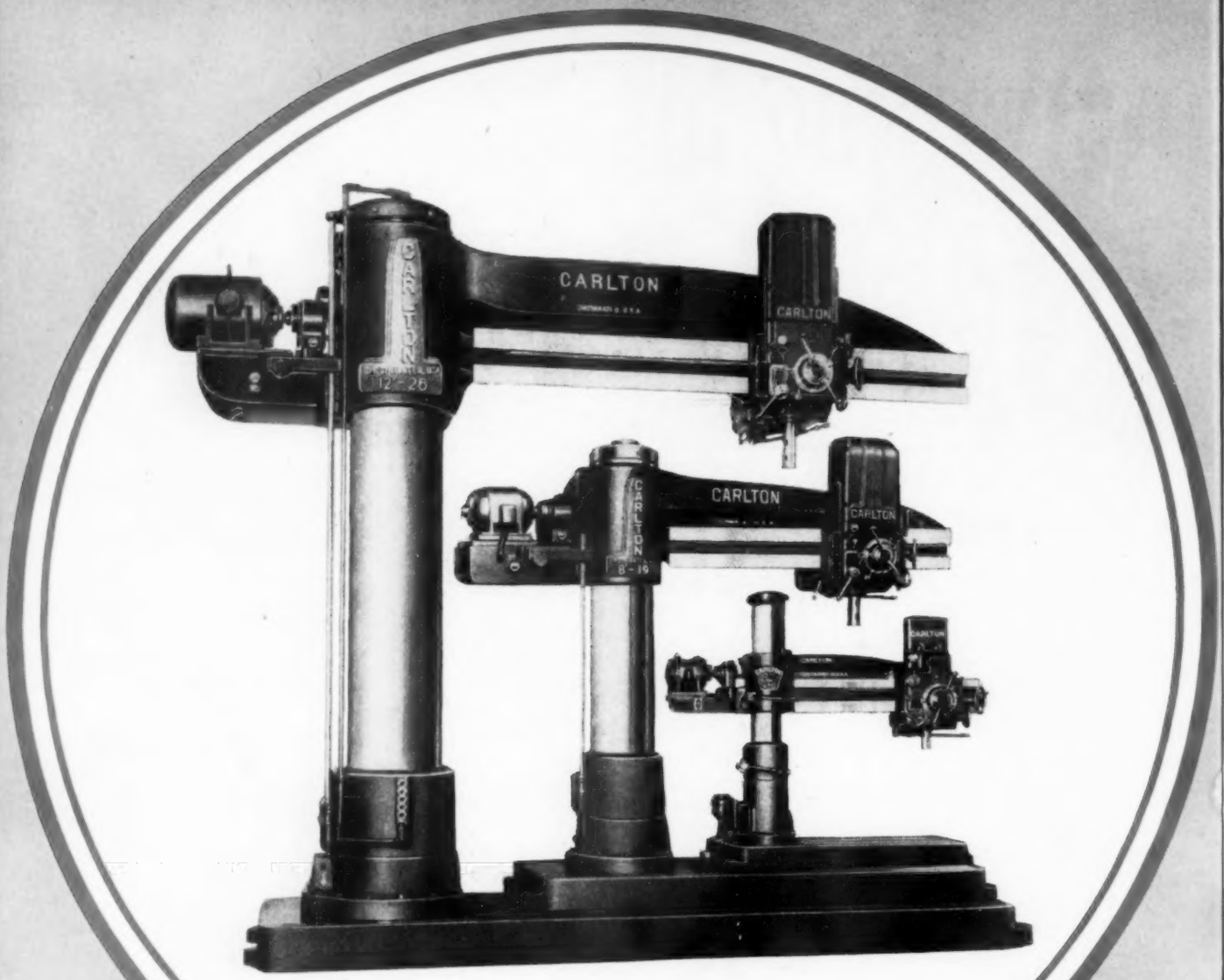
NAME.....

OCCUPATION OR TITLE.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....



ANNOUNCING

CARLTON'S latest development in Radial Drills

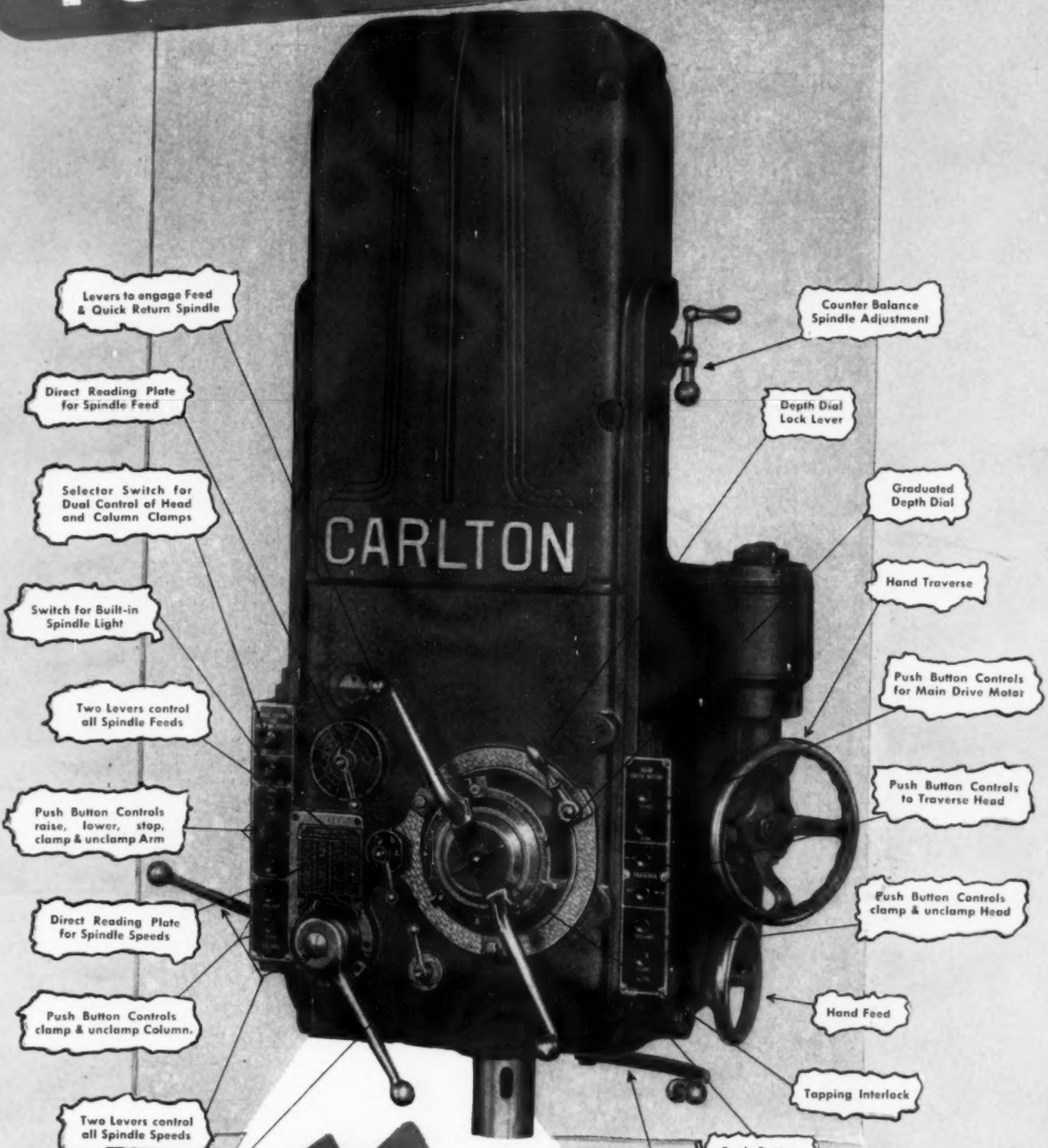
- Low hung drive to spindle
- All power driven parts running in oil
- Gears of hardened alloy steel with ground teeth
- Constructed on unit principle
- Concentrated and convenient pushbutton control
- Quiet running at all speeds

THE CARLTON MACHINE TOOL COMPANY

Manufacturers of RADIAL DRILLS *Exclusively*

CINCINNATI 25, OHIO, U. S. A

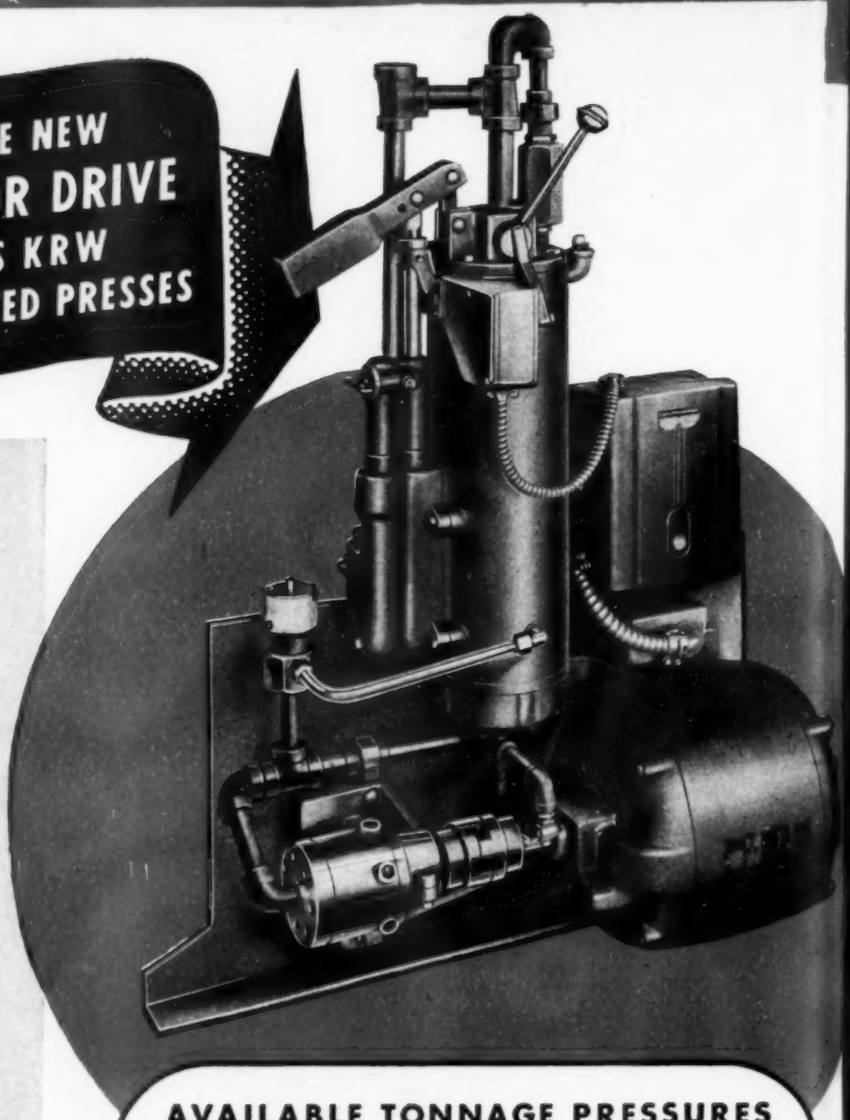
CARLTON Centralized PUSHBUTTON CONTROLS

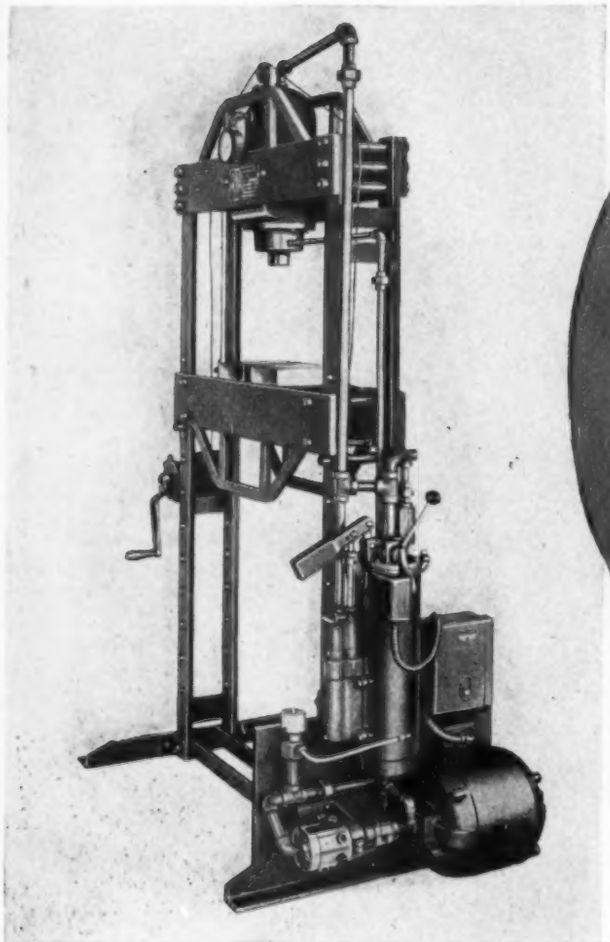

CARLTON
Levers to engage Feed & Quick Return Spindle
Direct Reading Plate for Spindle Feed
Selector Switch for Dual Control of Head and Column Clamps
Switch for Built-in Spindle Light
Two Levers control all Spindle Feeds
Push Button Controls raise, lower, stop, clamp & unclamp Arm
Direct Reading Plate for Spindle Speeds
Push Button Controls clamp & unclamp Column.
Two Levers control all Spindle Speeds
Power or Hand Feed Selector
Counter Balance Spindle Adjustment
Depth Dial Lock Lever
Graduated Depth Dial
Hand Traverse
Push Button Controls for Main Drive Motor
Push Button Controls to Traverse Head
Push Button Controls clamp & unclamp Head
Hand Feed
Tapping Interlock
Push Button Safety Stop
Start-Stop Reverse Lever

CHECK *these* CARLTON *features..and specify Carlton for "hole" economy*

Now...Modernize

THIS IS THE NEW
KRW MOTOR DRIVE
THAT FITS KRW
HAND OPERATED PRESSES





This is a Standard KRW Press Equipped with MOTOR-DRIVE

Illustration shows how the compact motor-drive unit is connected to a standard KRW hand-operated hydraulic arbor press. Complete installation data is supplied with all units.

AVAILABLE TONNAGE PRESSURES
25 - 50 - 60 TON PRESSES

AIR PRESSURE	7" AIR CYLINDER		9" AIR CYLINDER	
100 TO 200 POUNDS	2" Oil Cylinder	1¾" Oil Cylinder	2" Oil Cylinder	1¾" Oil Cylinder
	10 to 22 Tons	14 to 29 Tons	17 to 35 Tons	23 to 47 Tons

75 TON PRESS

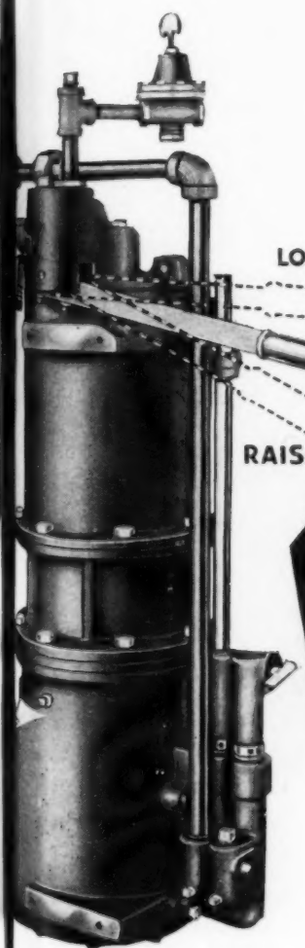
AIR PRESSURE	9" AIR CYLINDER	
100 TO 200 POUNDS	2" Oil Cylinder	1¾" Oil Cylinder
	25 to 51 Tons	33 to 68 Tons

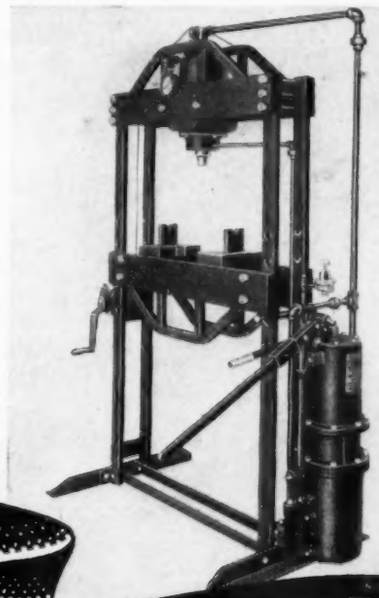
KRW Motor Drive develops up to Full Capacity of any KRW Hand-Operated Press.

YOUR KRW ARBOR PRESSES

FOR HIGH PRODUCTION WITH EITHER AIR-OIL OR MOTOR-DRIVEN POWER UNITS

● Thousands of standard KRW Hydraulic Arbor Presses can now be power equipped for production use by adding the new KRW Power Units. These units . . . either air-oil or motor-driven . . . are available for 25, 50, 60 and 75-ton KRW standard presses. When power equipped, and utilizing simple, inexpensive dies, these standard presses are adaptable to a great many bending, forming, stamping and straightening operations . . . relieving heavier and more expensive equipment for other work. Either type power unit is easily attached to the press. Adding the unit in no wise affects the famous KRW two-speed hand pumping feature . . . press can still be hand-operated. Study the specification table shown here in terms of your work-pressure and motor needs. Give us the serial number of your KRW press and electric current requirements and we will quote you price and quick-delivery date. Put your idle or infrequently used KRW hand-operated Arbor Presses to work where they will pay big dividends . . . on your production line.





THIS IS THE **NEW** KRW AIR-OIL DRIVE THAT FITS STANDARD KRW HAND OPERATED PRESSES

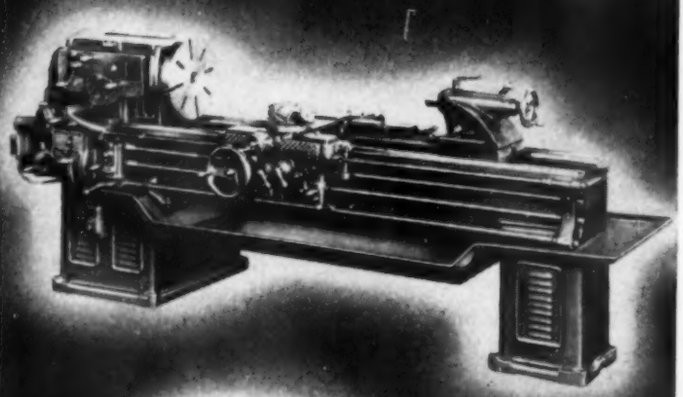
THIS NEW CATALOG WILL SAVE YOU *Money!*

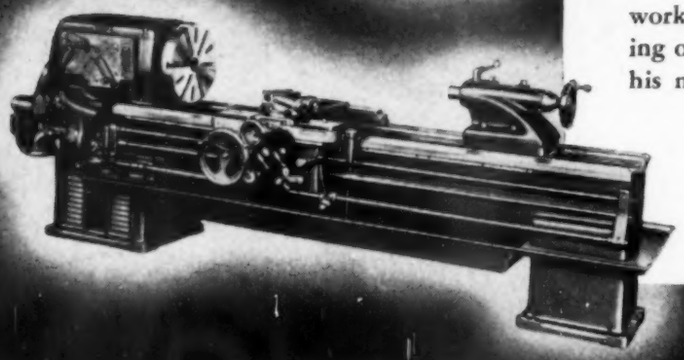
K. R. WILSON
215 MAIN ST., BUFFALO 3, N. Y.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.
Please send me complete information on
☐ KRW Air-Oil Power Units
☐ KRW Motor-Drive Power Units
11

Serial number of our KRW Press is .....
Voltage ..... Cycle ..... Phase .....
Firm .....
Address .....
City and Zone ..... *State* .....

Sidney Lathes





Illustrating the wide range of Sidney Lathes . . . built in capacities from 14" to 32"

All are continuous tooth Herringbone geared head machines. The Headstock is particularly quiet in operation with both spindle and intermediate shaft supported by a center bearing.

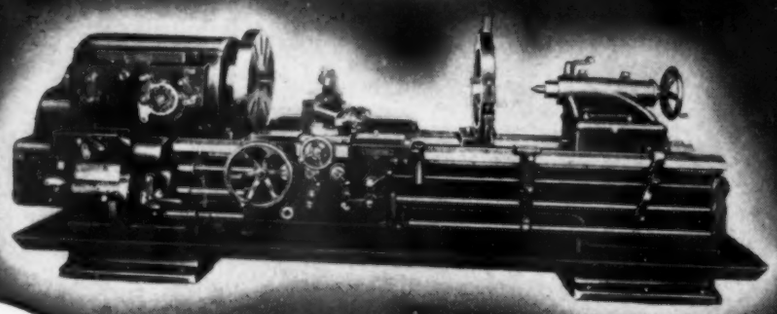
This gearing not only affords greater, smoother power on all sizes but results in highly finished accurate work free from all tooth marks.

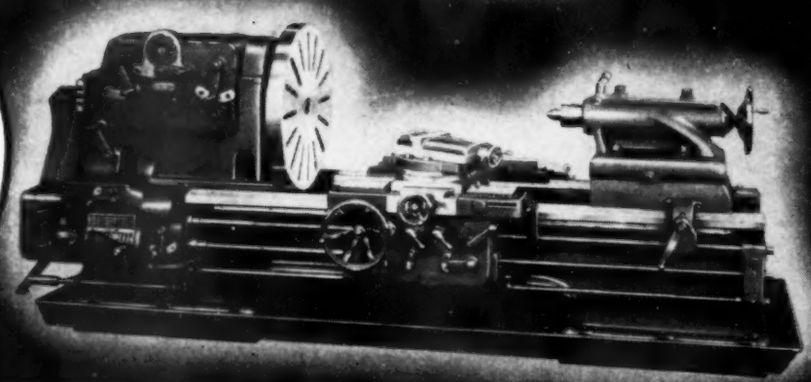
The departure from the conventional two wall bed to the Sidney four wall design with cross girts at frequent intervals assures the utmost in rigidity and maintaining alignment.

The operator is saved considerable leg work, and a great deal time by locating of controls within easy reach from his normal working position.

For power, speed and continued accuracy make your next lathe a Sidney.

Bulletins available.





Builders of Precision Machinery

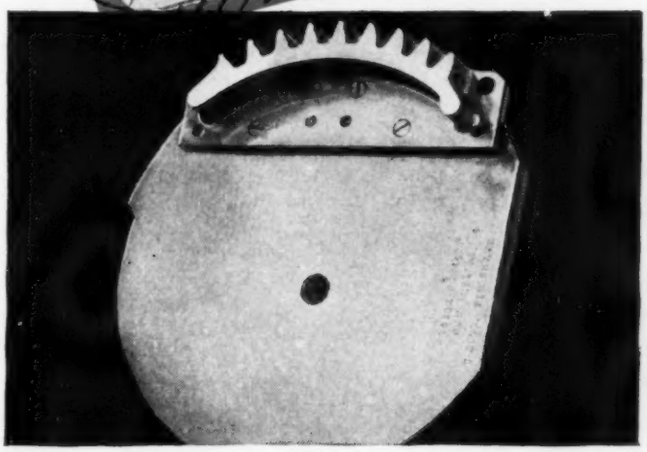
THE SIDNEY MACHINE TOOL COMPANY

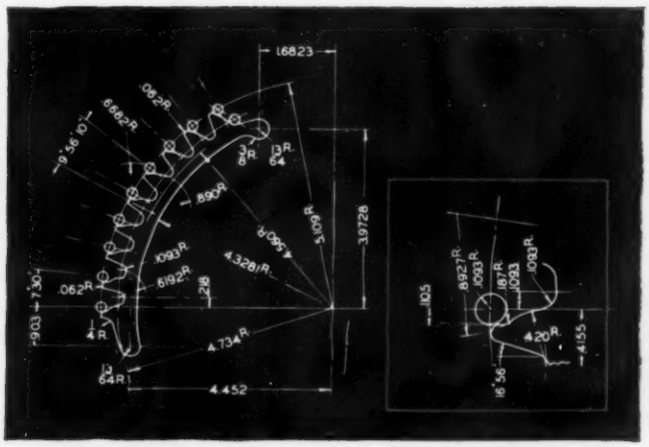
SIDNEY • OHIO

SIDNEY

ESTABLISHED 1904

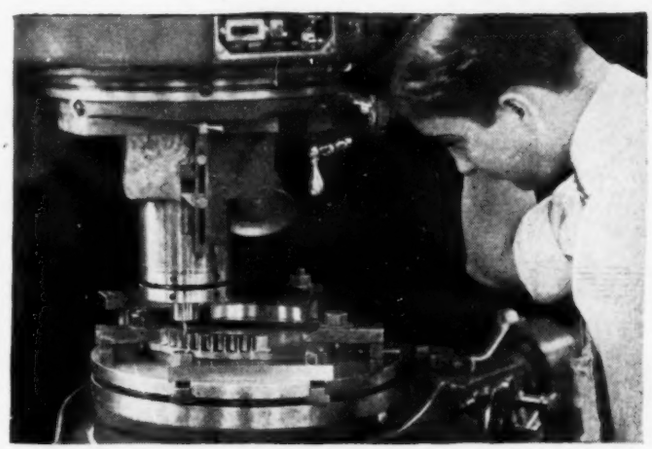
How to Mill this Shave Punch Complete in 60 Hours





1 **FAST!** 6 hours for layout and setup. 25 hours rough cut. 29 hours finish cut. Material: High carbon, high chrome steel. Total: 60 hours blank stock to finished shave punch. That's typical 2D Rotary Head Milling Machine performance.

2 **DIRECT!** Intricate shapes of punch teeth milled direct in workpiece. No fussing with models or templets. Blueprint was the only guide the operator had or needed. Precision control of all combinations of cutting movements did the rest.



3 **ACCURATE!** Single setup held chance of error to minimum. Operator relied on built-in precision, control and measuring devices — had no difficulty holding tolerance to +.0005"−.0000".

Photos and information Courtesy of National Cash Register Co.

KEARNEY & TRECKER CORPORATION
MILWAUKEE 14, WISCONSIN
4731

4 For the Whole Story of how you can get the benefits of *Fast, Direct, Accurate* results on tough intricate jobs using the Model 2D Rotary Head Milling Machine—send for bulletin 1002C.

Zagar "More Production" COLLET FIXTURES and COLLETS

DO MORE
FASTER
BETTER
AT LESS
COST

★ INCREASE YOUR PROFITS by producing better work . . . faster . . . with Zagar "More Production" Collet Fixtures and Collets! Whatever the job, milling, drilling, tapping, slotting, grinding or turning . . . Zagars do it easier — faster — better — *without costly special fixtures and tooling*. Use Zagars for holding or indexing in horizontal or vertical positions. Load and unload while running; air-operated . . . manual . . . or fully automatic control.

ZAGAR TOOL, INC.,
23880 Lakeland Blvd., Cleveland 17, Ohio

Write for Catalog No. 8-1

1 Intricate end milling operations are simplified with a Standard Zagar Indexing Fixture (1" and 2" capacity models).

2 The use of this Zagar Indexing Fixture insures greater production and maintains high accuracy standards on tough alloys.

3 Easy to set up — Zagar V-H Holding Fixture mounted directly on the table eliminates angle plates — minimizes set-up time.

4 Load and unload while milling — two Zagar air-operated fixtures utilize the full capacity of an automatic miller.

5 Zagar Speed Chuck loads and unloads without stopping machine — lengthens equipment life — eliminates cumbersome wrenches — doubles production.

Zagar
PRODUCTION TOOLING FOR INDUSTRY

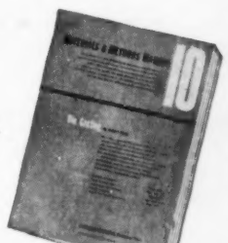
One of five self-contained H-P-M all-hydraulic die casting machines installed at The Hoover Co., North Canton, Ohio, for production of intricate, vacuum cleaner castings.

For precision parts *Quick*... use modern *die casting* equipment by H-P-M

short metal supply slowing up your pro-ction? Are you looking for a way to make ur product better, lighter—at lower cost? Here's a way to do it—by nonferrous design. the installation picture shows, The Hoover . uses large, intricate die castings, precision-oduced on H-P-M *All-Hydraulic* High-essure Die Casting Machines.

The secret of successful production on large rts like these is the big, rugged, straight-line draulic die clamp, *an exclusive H-P-M design ature.* This outstanding development permits confining the pressure to the die cavities. There's less flash—and castings are more uniform. Automatic slowdown prevents die slam and results in less die wear and breakage. Also, there's automatic cycle control, hydraulic core pulls and hydraulic automatic ejection. These all add up to less operator fatigue, resulting in higher production output. With H-P-M you'll have less down-time for repairs—and less spoilage.

If our standard machines don't fit your die casting requirements, we can build production units to your specifications. May we talk it over?



For an authoritative, unbiased, twelve-page manual describing die casting materials and methods, write us for a copy of reprint manual No. 10.

HE HYDRAULIC PRESS MANUFACTURING CO. Mount Gilead, Ohio, U. S. A.

Branch Offices: New York, Philadelphia, Cincinnati, Cleveland, Detroit and Chicago. Representatives in other principal cities

HPM

All-Hydraulic Self-Contained **Die Casting Machines**

REVOLUTIONIZING PRODUCTION WITH HYDRAULICS SINCE 1877

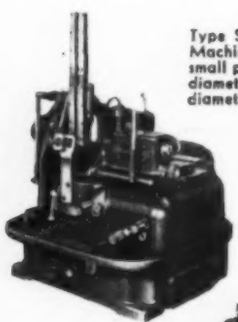
1947

LET'S LOOK AT
WITH *Barber-Colman* HOBBING

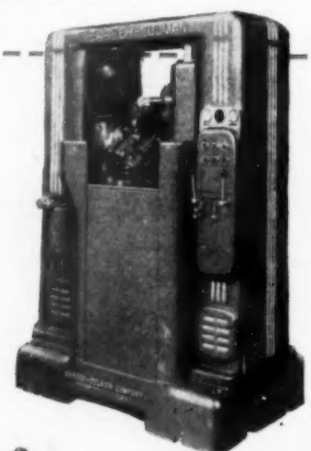
As a cost conscious production engineer, factory manager, or superintendent, you are vitally interested in maintaining peak production efficiency. You look for equipment that is capable of fast metal removal, high accuracy and finish, and wide flexibility to cover both special-purpose and general machining.

It is a fact that machines with these features reduce investment costs and increase productive capacity.

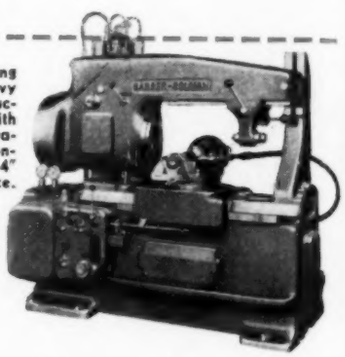
It is also a fact that cost per piece machined is lower, and that shorter time is required to justify original investment.



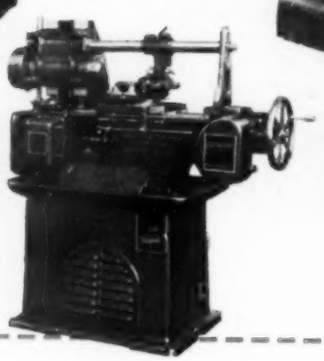
Type S Automatic Hobbing Machine — for production of small precision gears up to 1" diameter x ½" face and 200 diametral pitch.



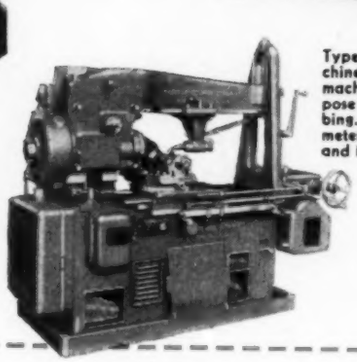
Type V Vertical Hobbing Machine — semi-automatic machine for mass production. Capacity 8" diameter x 9" face, 4 diametral pitch in steel.



Type D Hobbing Machine—a heavy duty high production machine with hydraulic feed, traverse and cycle control. Capacity 14" diameter x 14" face. 3 pitch and finer.



No. 3 Hobbing Machine — Capacity 5" diameter x 7" face. 12 pitch and finer. Built also in precision type.



Type A Hobbing Machine — a rigid accurate machine for general purpose or production hobbing. Capacity 12" diameter x 12" face. 4 pitch and finer.

Many cost reducing features are available in Barber-Colman standard Hobbing Machines. Economy and increased production are found in their capacity for high speed continuous operation, lower maintenance requirements and power reserve for cutting tough materials. Equally important is maximum accessability and operator convenience, and adaptability to a wide range of work, including spur and helical gears . . . splines . . . worms . . . worm gears . . . and threads . . . on the same machine.

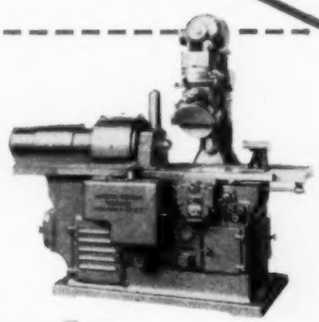
Barber-Colman

ACCURACY...RIGIDITY...POWER...FOR HI-PRODUCTION HOBBING

COST FACTS!

EQUIPMENT AND CUTTING TOOLS

INVESTIGATE — Improved B-C Cutting Tooth Designs for high speed milling of light metals — outstanding results achieved in Carbide Milling. Ask for Data Sheets 37-42. Also, latest bulletins on Hobbing Machines, Sharpening Machines — Catalog HM.

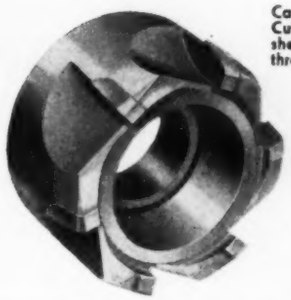


No. 4 Automatic Hob Sharpening Machine — for Hobs and Form Cutters. Capacity up to 12" diameter x 12" face.

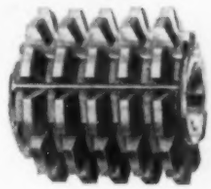
Reamers—Fluted, inserted blade, and carbide tipped.

Milling Cutters — "Paraform" design, formed, standard and special.

Combination Sharpening Machine — sharpens Hobs, Cutters and Reamers. Straight gashed work up to 24" stroke or maximum 30° helix with 8" stroke.



Carbide Tipped Milling Cutters — Standard type shell end mills, side mills, thread mills, and specials.



Hobs — Ground and Unground, standard and special.

IMPORTANT COST FACTORS

- AUTOMATIC CYCLING
- HYDRAULIC OPERATION
- HIGHER FEEDS AND SPEEDS
- NEW CUTTING TOOTH DESIGNS
- POSITIVE CONTROLLED SHARPENING
- LONGER CUTTING LIFE

Consider these points in the selection of your next Hobbing Equipment and Cutting Tools. Barber-Colman experience can help you improve your cost picture.

Company

GENERAL OFFICES & PLANT
111 LOOMIS STREET
ROCKFORD, ILLINOIS

BARBER B-C COLMAN

MODERN MACHINES WITH ORDINARY CUTTING TOOLS ARE NOT FULLY EFFICIENT

COCOON

YOU CAN IGNORE the hazards of global shipment or storage in the open for long periods when you package with COCOON! This amazing protective packaging, applied with a spray gun, affords perfect protection against snow, rain, sun . . . keeps safe *anywhere* anything from a ball bearing to a locomotive!

Check the amazing features of COCOON against *your* protective packaging needs; then, submit your problem to us for analysis. *R. M. Hollingshead Corporation, Coatings Division, Camden, New Jersey; Toronto, Canada.*

Spray gun and air supply only equipment needed . . . No rust preventive treatments are necessary . . . Permits packaging of equipment "ready to use" . . . Resists attack by major mildew and mold groups . . . Tensile strength 2000 p.s.i.; elongation 200% . . . Won't soften at plus 180°F.; remains flexible at minus 40°F. . . . Has extremely low moisture-vapor transmission rate . . . Makes packaging easy regardless of size and shape complications . . . Eliminates need for any pre-designed form or fabrications . . . Easily stripped from equipment in long, continuous sheets.

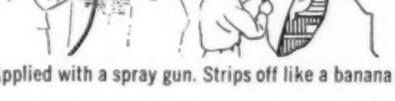
Whiz

A PRODUCT OF

Hollingshead

LEADER IN MAINTENANCE CHEMICALS

Package With Cocoon



Applied with a spray gun. Strips off like a banana peel

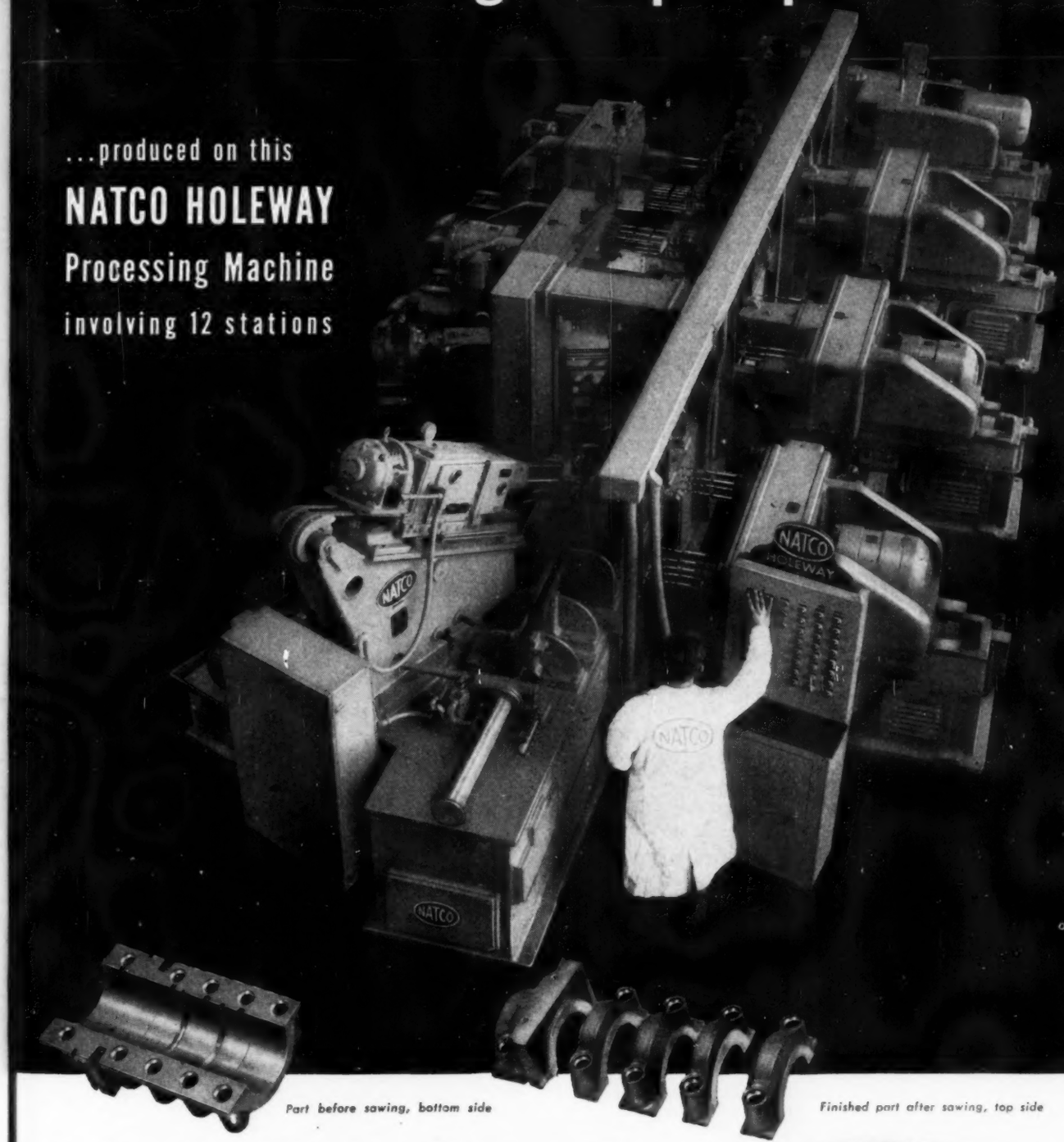
475 Bearing Caps per Hour

...produced on this

NATCO HOLEWAY

Processing Machine

involving 12 stations



Part before sawing, bottom side

Finished part after sawing, top side

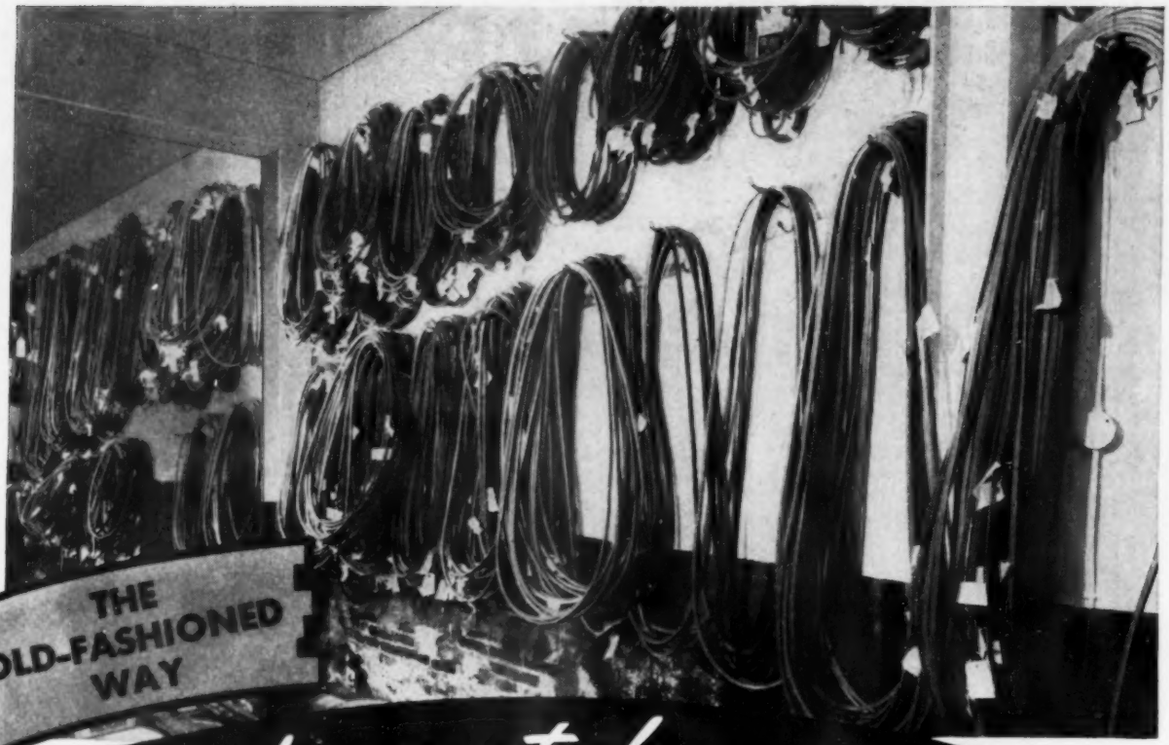
One man on this NATCO HOLEWAY Processing Machine produces 95 of these bearing cap sets (475 individual bearing caps) per hour

• In keeping with the trend to automatic handling — less operator fatigue and more production per man — NATCO provides this processing type machine arranged to complete the following operations between loading position # 1 and unloading position #12: drills 20 holes; mill chamfers both sides of center bearing; drills 2 angular holes; combination drills and countersinks 2 holes; chamfer 10 holes; taps two holes; countersinks 10 holes; spotfaces 10 holes; mills 5 bearing liner lock notches; saws finished bearing casting into five component parts as shown above—and unloads automatically.

NATCO

Write today for NATCO Machine Circular 145-A

NATIONAL AUTOMATIC TOOL COMPANY, INC., RICHMOND, INDIANA, U.S.A. • *Branch Offices:* 1809 Engineering Building, Chicago • 409 New Center Building, Detroit • 1807 Elmwood Avenue, Buffalo • 2902 Commerce Building, New York City



THE OLD-FASHIONED WAY

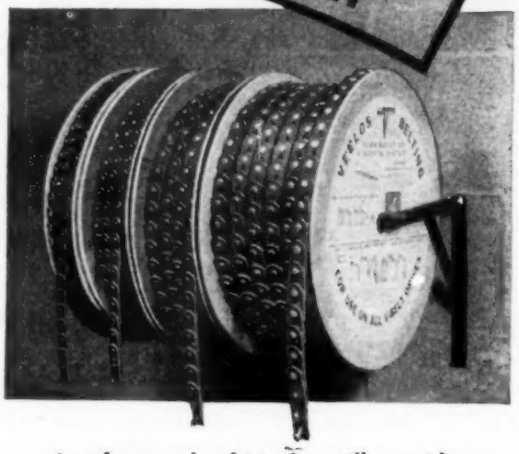
How do you stock your V-belts?

WHY stock a costly and confusing assortment of endless V-belts when you need only a few reels of Veelos, the link V-belt? With only four sizes of Veelos you can make up 316 standard sizes of endless belts. With Veelos, storing spare sets of belts for individual drives becomes outmoded. Expensive, wasteful belt inventories are eliminated . . . deterioration of spare V-belts is ended.

Veelos on reels assures a neat, orderly stockroom. Space is saved. Paper work is reduced. Any desired length of V-belt is always available. Veelos is made in all standard widths, fits all standard grooves, is packaged on standard 100-foot reels.

Veelos sales engineers are located in all principal cities; over 300 distributors throughout the country.

THE MODERN WAY



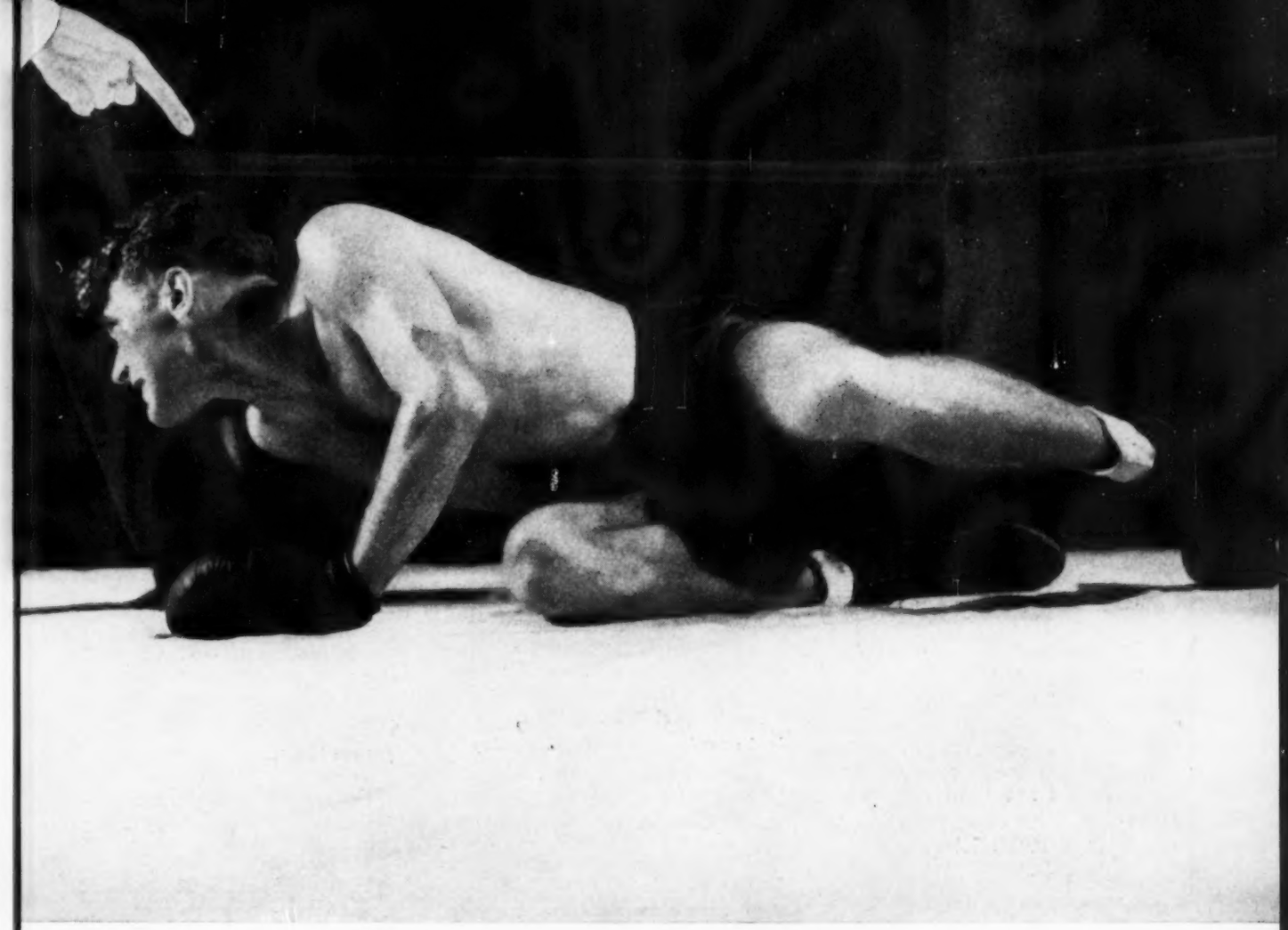
Just four reels of Veelos will provide 316 sizes of endless V-belts.

VEELOS
THE LINK
V-BELT

Adjustable to any Length
Adaptable to any Drive

MANHEIM MANUFACTURING & BELTING CO.
MANHEIM, PENNSYLVANIA

Tested • Proved • Adopted . . . by American Industry



DOWN TIME can knock out your profits!

FIGHT costly down time on your metal working machines with Cimcool—the amazing new chemical emulsion. It incorporates an entirely new principle in cutting fluids . . . reduces down time in three definite ways.

1. Cimcool increases tool life. Its chemical lubricity reduces the heat from friction; and it absorbs what heat there is faster through a unique physical change in the coolant itself. Cimcool actually keeps tools and chips cool to the touch. Increased tool and wheel life results—50 per cent—100 per cent—even 200 per cent*.

2. Cimcool's low surface tension allows rapid settling out of chips and grit—means clean pump and supply lines.

3. Cimcool is not subject to rancidity, thus permitting fewer changes of cutting fluid.

CIMCOOL Solves MANY Problems

- Faster cooling allows faster cutting.
- Uniform work temperature (increases accuracy).
- No fire hazard—No smoke—No slippery film.
- Non-irritating—Doesn't grow rancid.
- Contains long-lasting rust inhibitor.
- Covers 85% of all metal working jobs.

*We'll gladly show you letters supporting this statement.

CIMCOOL

THE MULTI-PURPOSE CUTTING FLUID

Trade Mark Reg. U. S. Pat. Off.

CIMCOOL DIVISION of THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U. S. A.

1947

The CONE AUTOMATIC MACHINE COMPANY sees many GOOD THINGS AHEAD

It is reported that . . . . . .

Danielson Mfg. Co. of Danielson, Conn., is making a soft hammerhead of nylon that won't chip or bounce.

get ready with CONE for tomorrow

Windshield glass can be kept warm when coated with an electrically conductive transparent film called "Nesa", manufactured by Pittsburgh Plate Glass Co.

be ready with CONE for today

Eastman Kodak's process of molding small lenses in an atmosphere of nitrogen promises, when manufacturing technique is refined, to produce lenses satisfactory for all but the most critical uses.

get ready with CONE for tomorrow

General Electric's new silicone paint is said to permit clearer, brighter colors for automobiles, refrigerators, electric ranges, etc., and to "last a lifetime."

be ready with CONE for today

Air Reduction Co. claims to have perfected a method of flame-cutting stainless steel to close tolerances at high speed without affecting the physical properties of the metal.

get ready with CONE for tomorrow

American Cyanamid Co. has installed hot water pipes under 600 feet of roadway connecting its plant with the highway. The heat will keep the road free from ice and snow.

be ready with CONE for today

The Mellon Institute has reported on the use of ethylsilicate as a vehicle in paint. Finishes made with it are said to resist heat, retard fire and not to darken with age.

get ready with CONE for tomorrow

C. G. Conn Ltd. has an electronic organ that produces its tones by vacuum tubes and is said to be equivalent to an organ with 1,333 pipes.

Bell Aircraft Corp. is making a vending machine mechanism that makes change.

be ready with CONE for today

The Dobeckmun Co. of Cleveland is making an aluminum foil yarn, protected by a plastic surface from corrosion, for use in textiles in combination with other yarns.

get ready with CONE for tomorrow

Seal Peel Inc., of Detroit, is sending a shipment of various products, protected only by plastic dip coating, on a round-the-world flight to test the value of this type of packaging in actual service.

be ready with CONE for today

Dow Chemical Company's "Styrofoam" is a pure white cellular insulating material with only 18% of the weight of cork.

Atlas Supply Co., makers of tires and accessories, is showing its wares in a showroom built inside a DC4 and called the "Sky Merchant."

get ready with CONE for tomorrow

Linde Air Products Co. calls its method of flame-cutting rock (as for oil wells) "fusion-piercing." It is said to have drilled holes as deep as 450 feet at an average rate of 10 feet per hour.

be ready with CONE for today

The "Solexol cold fractionation" process developed by M. W. Kellog Co. is expected to be used in seven plants now building throughout the world. The process resembles that used for petroleum, but is applied to many basic oils and fats including soy bean, linseed, tallow, sardine and shark liver.

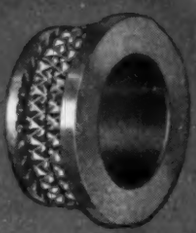
get ready with CONE for tomorrow

The R.C.A. electronic color television system will be made available to the entire industry.

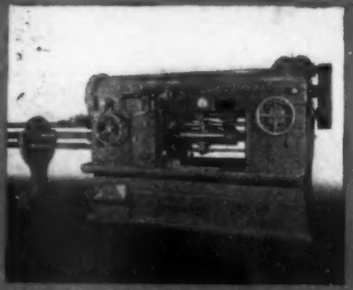
FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION

Impressively Conomatic!

This piece was produced from 2⅛" dia. S.A.E. 1112 by 18 tools in 12 seconds on a 2⅝" Six-Spindle Conomatic.



Any good multiple spindle automatic should handle the ordinary run of work. But the *tough* jobs are profitable on Cones.



Ask your CONE representative to show you our new color motion picture

CONE

AUTOMATIC MACHINE CO., INC. ★ WINDSOR, VERMONT, U.S.A.

37

FORMED CUTTERS BY *Union*

You can produce odd-shaped parts accurately and at profitable high speeds with the Union Formed Cutters. Cutters to fit any machine . . . to cut any practical shape . . . in any metal . . . can be made either from samples of your work, from your old tools, or from drawings. Your exact dimensions, specifications and tolerances will be followed faithfully, even when you request accuracy beyond normal commercial limits. Use Union Formed Cutters—and all the tools in the complete Union line—to bring every metal cutting job up to a uniform high standard.

UNION TWIST DRILL COMPANY
ATHOL, MASS.

Butterfield Division, Derby Line, Vermont
Butterfield Division, Rock Island, Quebec
S. W. Card Mfg. Co. Division, Mansfield, Mass.

STORES:

New York: 61 Reade Street
Detroit: 5527 Woodward Ave.
Los Angeles: 524 E. Fourth St.
Chicago: 11 So. Clinton St.
San Francisco: 121 Second St.
Seattle: 568 First Ave., So.

CARD

Get Card quality on all your tapping jobs by taking advantage of Card complete service. Send details of your troublesome jobs, and we'll advise you on all the many factors that influence good thread production — preliminary drilling and reaming, thread depth, feed and speed, type of coolant, and — of course — the best Card Tap to do the job.

GET CARD QUALITY FROM THESE STORES

NEW YORK:
61 Reade Street

CHICAGO:
11 South Clinton Street

DETROIT:
5527 Woodward Avenue

LOS ANGELES:
524 East Fourth Street

SEATTLE:
568 First Avenue, South

S. W. CARD MFG. CO.
MANSFIELD, MASS.
Division of the
Union Twist Drill Co.

REAMERS BY *Butterfield*

A COMPLETE LINE

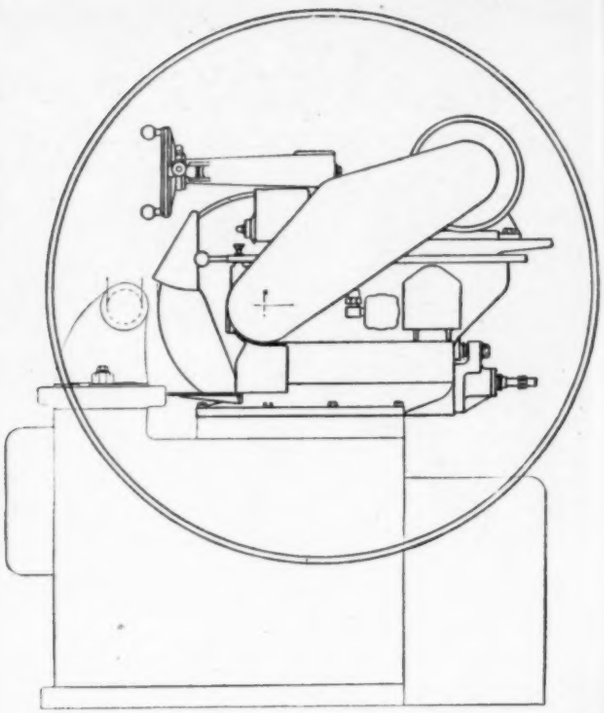
Why Butterfields? Because you can choose with confidence the one right tool for every job from this single, convenient source of supply . . . Because Butterfield's specialized skill and experience in reamer design and manufacture gives you tools that can be depended upon—always—to give superior performance, greater tool economy and uniform accuracy. For every reaming job . . . choose from a complete Butterfield line.

STORES

NEW YORK: 61 Reade Street
CHICAGO: 11 So. Clinton Street
CLEVELAND: Hal W. Reynolds 3346 Superior Avenue
DETROIT: 5527 Woodward Avenue
LOS ANGELES: 524 East Fourth Street
TOLEDO: 3636 Detroit Avenue
TORONTO: 137 Wellington Street, West
MONTREAL: 111 St. Paul Street, West
WINNIPEG: 212 Bannatyne Avenue
VANCOUVER: 119 Pender Street, West
GREAT BRITAIN: Charles Churchill & Co., Ltd., 27-34 Walnut Tree Walk, Kennington, London, S. E. 11, England. Branches at Birmingham, Manchester, Glasgow, Bristol and Newcastle-on-Tyne.

BUTTERFIELD DIVISION
Derby Line, Vt.
Rock Island, Que.
DIVISION OF THE
UNION TWIST DRILL CO.

You too can have FITCHBURG *Automatic* PRECISION GRINDING INEXPENSIVELY....

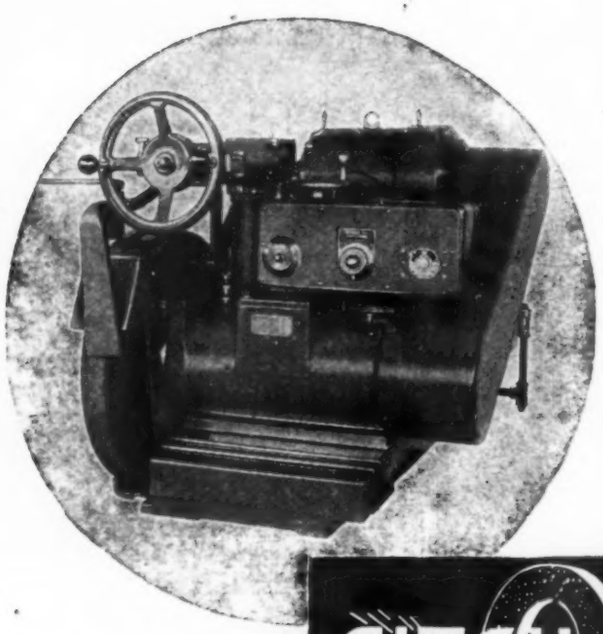


FITCHBURG Bowgage Head mounted on another make of grinding machine

by installing FITCHBURG Bowgage Heads on the Grinders you now have.

Just as we did in the above case—and in many others—we'll be glad *to prove to your satisfaction* the ease, the simplicity, and the *inexpensiveness* of installing Fitchburg Bowgage Heads on your present grinders. With your grinding equipment thus modernized, the resulting mass production applied to your precision grinding will soon pay off the small cost involved.

The FITCHBURG Bowgage Head is a self-contained grinding unit, with *all* its movements and controls within itself. It has rapid traverse, slow grinding feed, grinding dwell or spark out, and rapid return to starting position—all started by one push button. It is precise to .0002", minimizing spoilage. It can be removed and remounted for other work, if operations are changed—thus protecting your investment in grinding machinery. Fitchburg engineers will welcome the opportunity to help you solve your grinding modernization problem. There is, of course, no charge for this service. Send us the details—blueprints if available—and see how easily and inexpensively *you too* can have FITCHBURG AUTOMATIC PRECISION GRINDING in your shop.

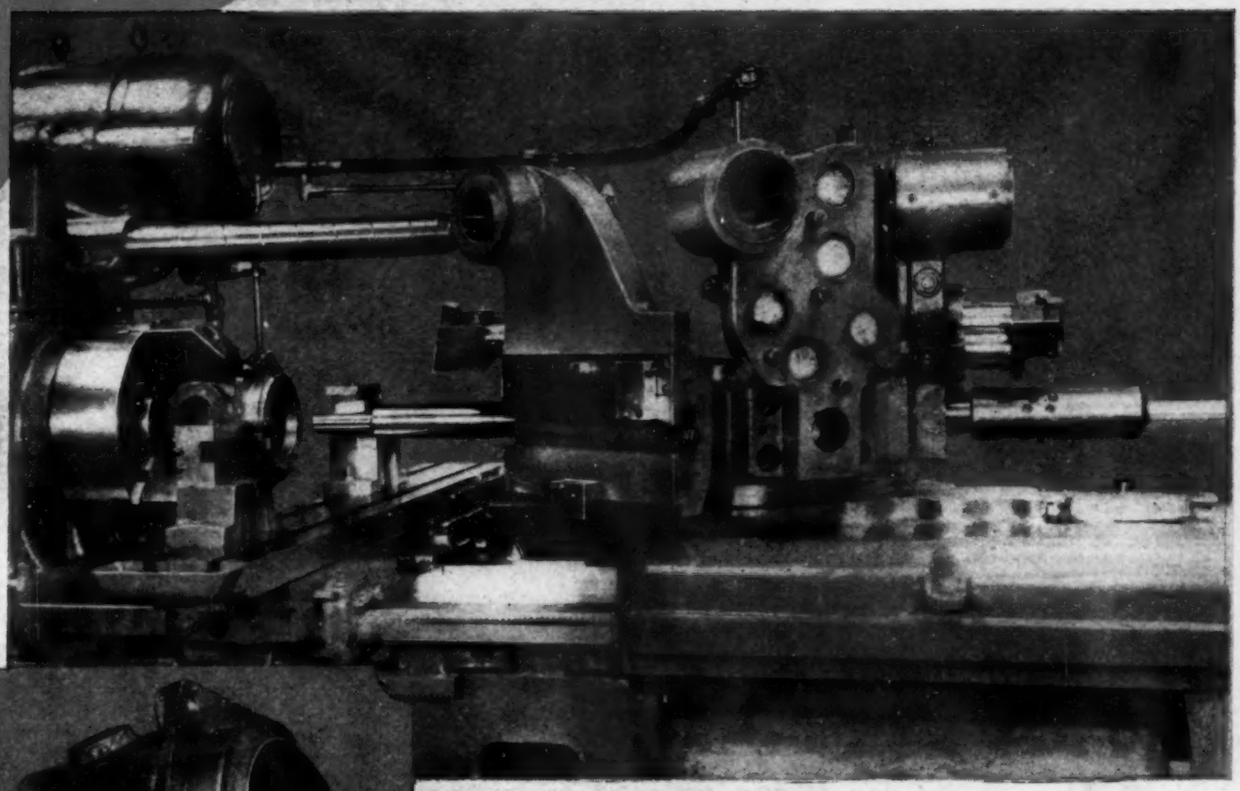


FITCHBURG BOWGAGE HEAD

FITCHBURG GRINDING MACHINE CORP.

FITCHBURG, MASSACHUSETTS, U.S.A.

Manufacturers of—Bowgage Wheelhead Units, Multiple Precision Grinding Units, Spline Grinders, Cylindrical Grinders, Gear Grinders, Both Full Universal Grinders and Special Purpose Grinders.



Machining operations on this Bevel Gear Case are simplified . . . . . by Special tooling on a . . .

P & J 5DLX Automatic

Ability to chuck irregularly shaped work and tool up for convenient and fast sequence of machining operations with P & J Automatics are exemplified here. The part—a grey iron bevel gear case—is required on a quantity production basis and in spite of its shape, the job must be handled with a minimum of floor-to-floor time. The actual production figures—available on request—disclose high machine output and reflect the outstanding advantages which accrue through the tooling possibilities available on P & J machines.

In cases where production needs warrant it, P & J is prepared to furnish two spindle machines for work now being performed on single spindles. Two-spindle P & J Automatics are available for double set-up in three sizes.

Ask P & J engineers to study your needs and offer recommendations for meeting them at lowest cost per piece.

DETAILS OF JOB . . .

Procedure:

Presenting closed end to spindle, grip on body at 3-13/16" radius with 2 jaws and on flat with 1 jaw.

Machine as follows:

1st T.F.—Rough bore 4.626" dia.; face flange; rough turn and bevel 7.500" dia.; face end at 6⅝" dia.

2nd T.F.—Finish the above; bevel 1/16" x 45° at bore.

3rd T.F.—Blank

4th T.F.—Blank

5th T.F.—Size turn 7.500" dia.

6th T.F.—Size bore 4.626" dia.

POTTER & JOHNSTON MACHINE CO.

Pawtucket, Rhode Island

Bunting is equipped to produce special Cast Bronze Bearings in any quantity from a single bearing to a million a month of a single size.

Bunting ability to deliver is traditional—whether the quantity be one or a million. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in principal cities.

Bunting

BRONZE BEARINGS ☆ BUSHINGS ☆ PRECISION BRONZE BARS

56

machining of slots and grooves

● Surface broaching is a machining method by which it is possible in many cases to produce parts with slots or grooves faster, more accurately and at lower tool cost than with the older conventional methods. The parts illustrated are merely a few of the many parts being machined on Footburt Surface Broaching Machines. Single and multiple grooves in the same plane are handled with simple clamping fixtures while parts such as the castellated nut are held in automatic indexing fixtures and are completed with one clamping. Send blueprints of your parts for recommendations on surface broaching.

THE FOOTE-BURT COMPANY • Cleveland 8, Ohio

Detroit Office: General Motors Building

Duplex Surface Broaching Machine

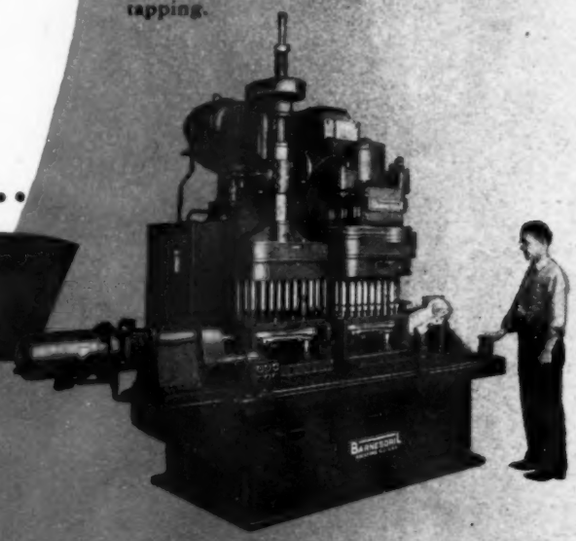
Footburt Patented Tooth Form

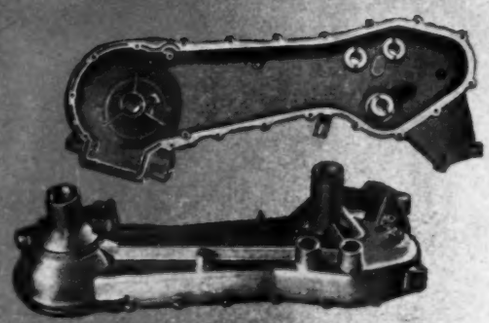
FOOTBURT *Surface Broaching*

For the SPECIAL
DRILLING and TAPPING JOB...

BARNESDRIL PRODUCTION UNITS INCREASE MARGIN OF PRODUCTIVITY AND LOWER COSTS

This BARNESDRIL Production UNIT is equipped with one vertical 23-spindle drilling head; one vertical 23-spindle tapping head; and two horizontal 2-spindle heads, one for drilling and the other for tapping.





This prominent washing machine manufacturer secured increased production with resultant lowered manufacturing costs using two special BARNESDRIL Production UNITS for drilling and tapping miscellaneous holes in transmission cases.

One BARNESDRIL Production UNIT performs both vertical and horizontal drilling and tapping operations on one side of the workpiece. The second BARNESDRIL Production UNIT performs similar machining operations on the other side of the part.

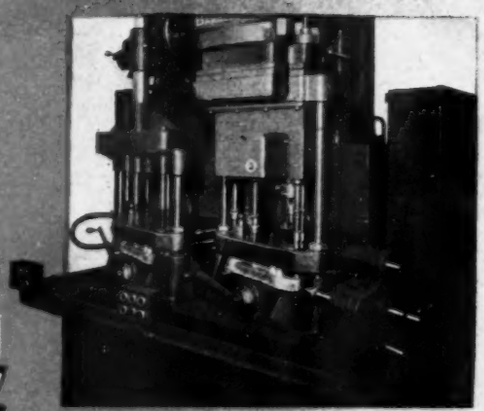
BARNESDRIL PRODUCTION UNITS FLEXIBILITY AFFORD GREATER ECONOMIES

Completely self-contained, BARNESDRIL Hydraulic Production UNITS have an unusual flexibility which permits their arrangement in any single or combinations of vertical, horizontal or angular positions; or they can be grouped around a rotating indexing table or drum for the most efficient handling of the work. Complete machines for either *standard* or *special* drilling, reaming, facing, boring and or tapping operations are designed and built for your specific requirements.

BARNESDRIL engineers can assist you with practical solutions for your special metal working jobs . . . giving you maximum production with reduced costs. There is no obligation for this service.

GET THIS BULLETIN

. . . which describes BARNESDRIL Hydraulic Production UNITS and their application to a variety of jobs. Send for Bulletin No. 150-D available without charge.



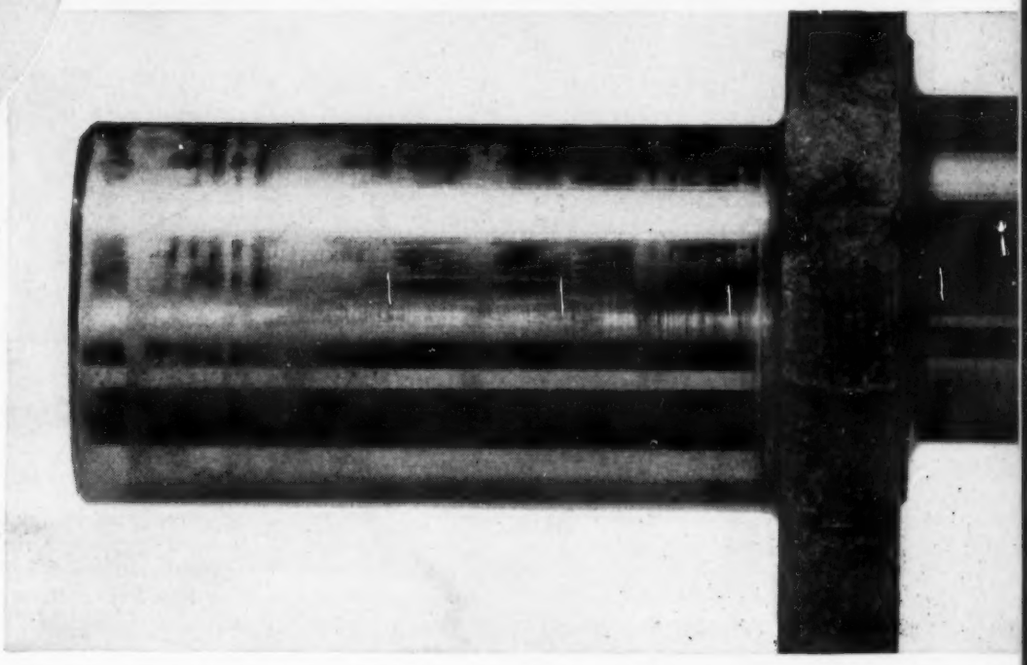
Close-up of spindle arrangement on second BARNESDRIL Production UNIT, equipped with one vertical 8-spindle drilling head; one vertical 8-spindle tapping head; and three horizontal 2, 3 and 4 spindle heads for drilling and tapping.

BARNES DRILL CO.

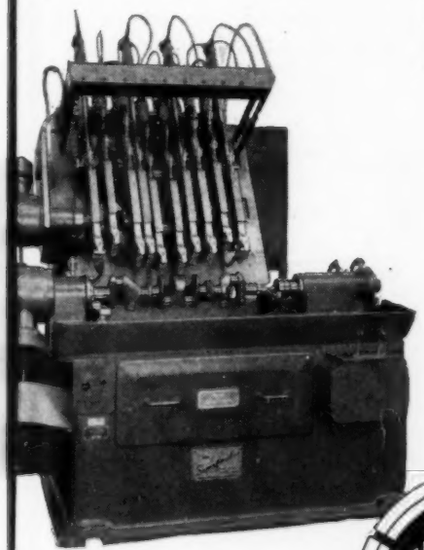
830 CHESTNUT STREET ROCKFORD, ILLINOIS U.S.A.

how SUPERFINISH proves a point

In a few seconds you can demonstrate the difference between a sanded and a Superfinished surface. Here, on a small crankshaft for an outboard motor, a Superfinishing stone curved to the exact radius of the part is held by hand and oscillated as the shaft is rotated. In a matter of seconds, as shown below, enough "smear metal" (softened by grinding heat) is removed to reveal the grinder ridges and flats, feed spirals, chatter marks and other defects injurious to bearings. Because the Superfinishing stone is rigid, it corrects *geometrical shape,* whereas emery cloth, being pliable, merely polishes the surface.



GISHOLT CRANKSHAFT SUPERFINISHER. All bearing surfaces on 6 or 8 cylinder crankshafts are superfinished simultaneously.



In a minute or less—on a Gisholt Superfinishing Machine—these surface defects will disappear, and a truly hard surface will be exposed. And the result is not only greater surface smoothness but a nearly perfect geometrical form.

Superfinishing actually increases load carrying capacity by *decreasing* the depth of the oil film. Less heat is generated, the bearing is more efficient, longer lived.

A very quick and inexpensive process, Superfinishing pays for itself many times over in better service and the elimination of bearing failures. A variety of Gisholt Superfinishing Machines is available for different types of work. Ask Gisholt Engineers for complete information about them.

GISHOLT

GISHOLT MACHINE COMPANY

1201 East Washington Avenue • Madison 3, Wis.

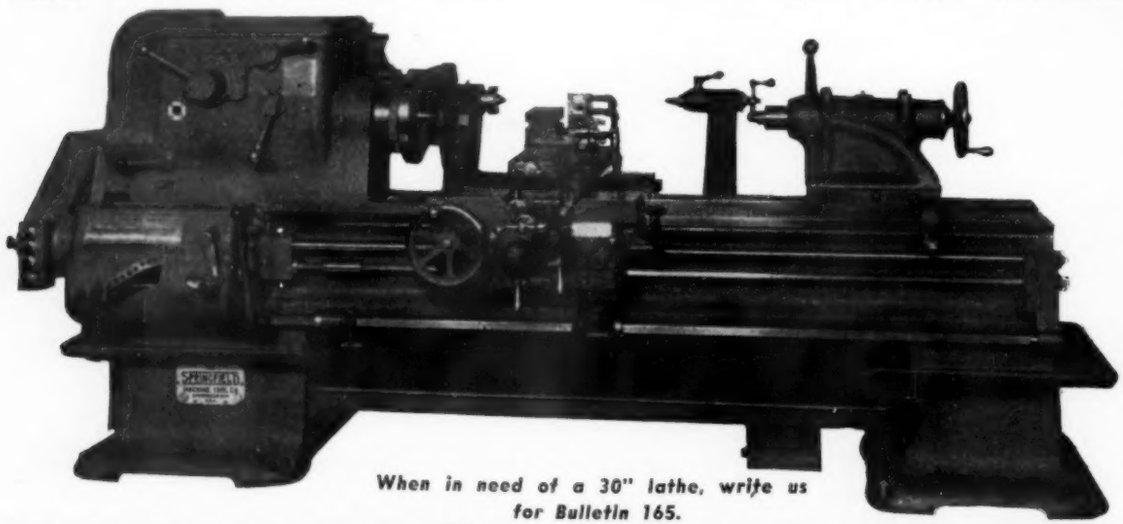
Look Ahead • Keep Ahead • with Gisholt

IRRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Massive—

Springfield 30" Medium Duty Geared Head Lathe

To handle those big jobs *and* the smaller ones choose Springfield Geared Head Lathes. Long, accurate performance is "built in" with the deep well-ribbed bed, with the nickel and chrome steel used and with the powerful massive design. Thirty-six changes of threads and feeds are available in the 30" lathe. Reverse gears are arranged to produce right- or left-hand threads without the use of wrenches and with a minimum of effort. Lead screws are tested to .001 inch to the foot and are used only for threads. A feed rod is supplied for all feeds.

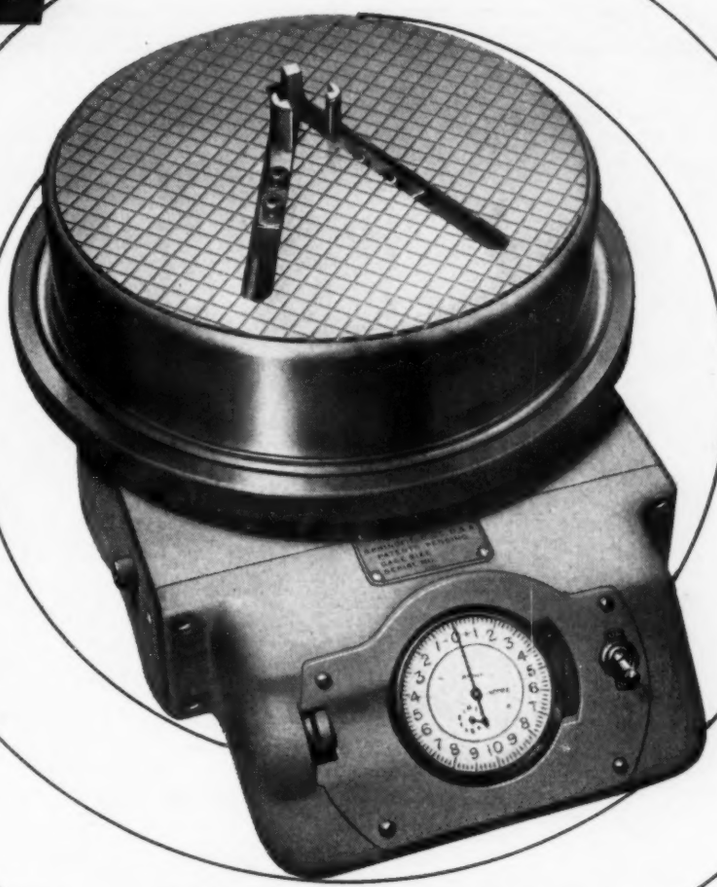


When in need of a 30" lathe, write us for Bulletin 165.

THE SPRINGFIELD MACHINE TOOL COMPANY

SPRINGFIELD **OHIO, U.S.A.**

NEW



UNIVERSAL DIAMETER GAGE

Another Bryant Postwar Development

The New Bryant Universal Diameter Gage offers faster, simpler and highly accurate inspection of internal or external plain diameters from ⅜ inches to 4 inches — in fact, operation is so simple that after the gage has been set to a master ring, the operator has merely to place a part on the contacts and check accuracy to the nearest .00002 inch on the dial indicator.

Functional design and sound construction result in many labor saving features and assure long lived accuracy in the new gage. The serrated steel work table is adjustable to accommodate parts up to 1½ inches in depth. Diameter measurement is accomplished with three precision-ground, hardened-steel contact points. Two are movable and travel in unison to facilitate setting for different diameters. The third is a stationary sensitive contact which may be operated by a finger-tip control lever when necessary. The points are designed to contact the work at 90 degrees and automatically center it regardless of diameter. To further insure accurate readings, a vibrator actuates the movable mechanism and the dial indicator to disclose very minute variations in the part being checked — this eliminates "feel" for fit.

The new Bryant Universal Diameter Gage simplifies and speeds inspection of varying sized plain diameters — cuts quality control costs to a new low — it will pay you to write for complete details.

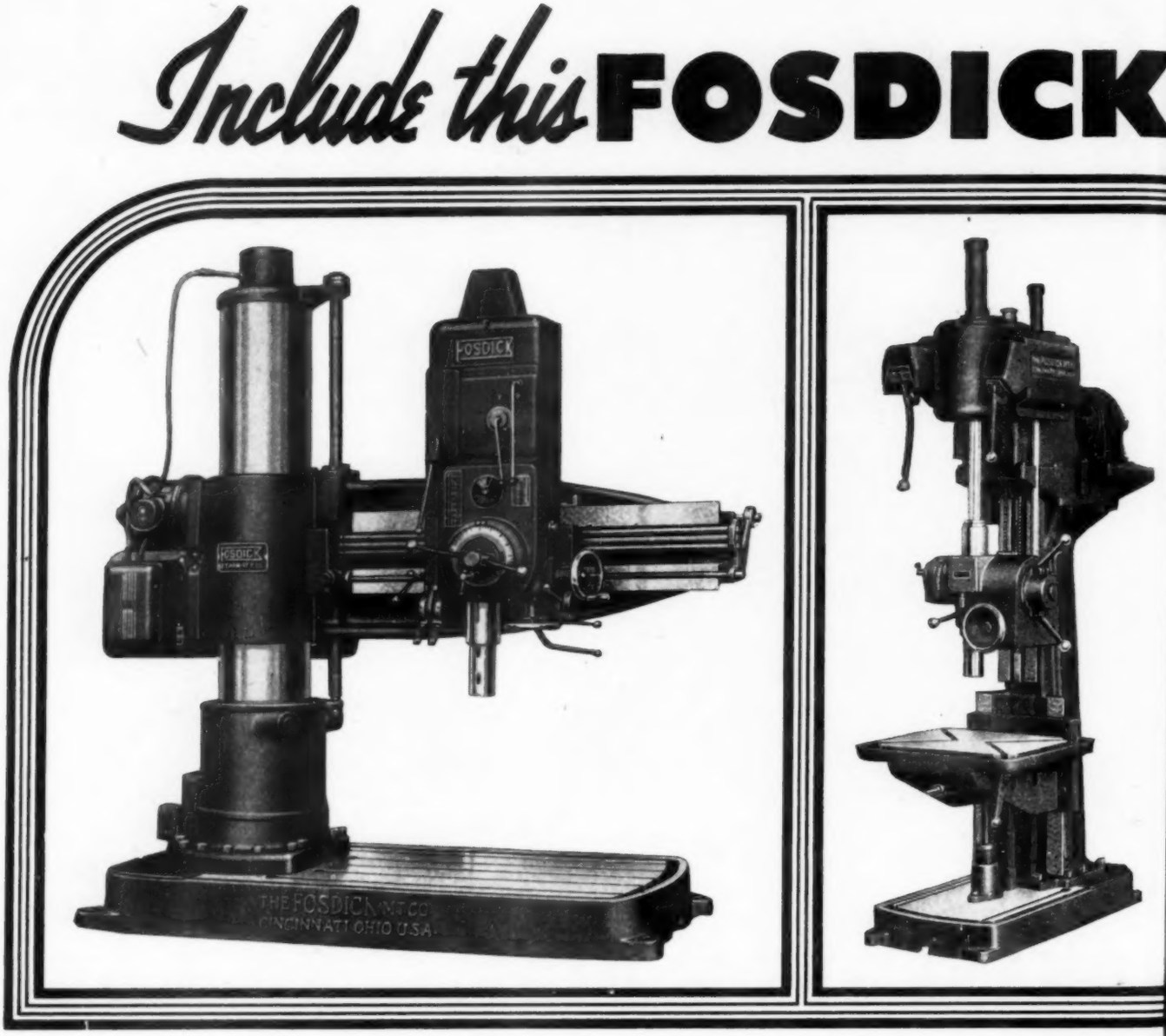
BRYANT

Also Bench Model Thread Gages, Adjustable Thread Gages, Squareness of Face Gages and Portable Thread Gages.

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

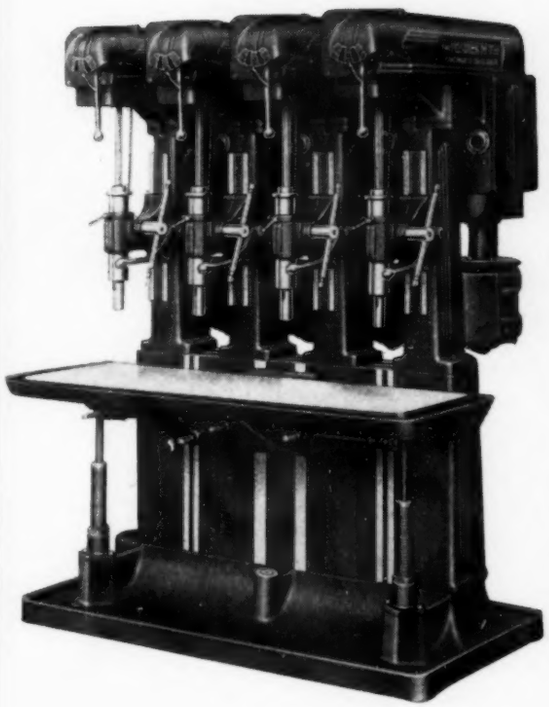
Include this FOSDICK

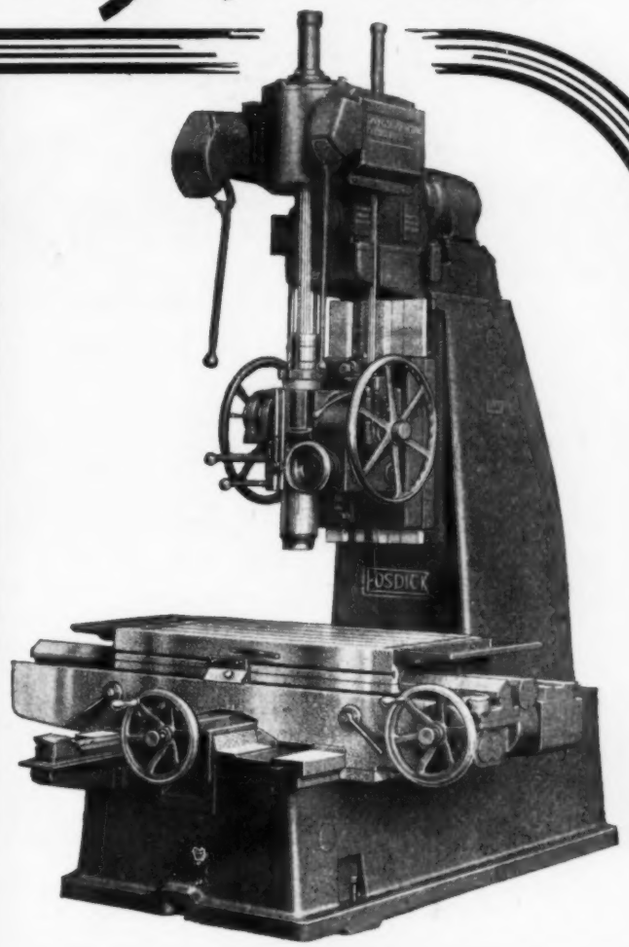


FOSDICK ECONOMAX HYDRAULIC RADIALS are available in the following sizes: 3-4-5-6-7 and 8 foot arms on column diameters from 11 inch to 19 inch to meet all requirements. The massive, well-balanced arm, the sturdy column construction, and the rigid base design provide dependable accuracy. Centralization of controls and hydraulic rapid traverse to head and column clamp saves time and effort on part of operator and makes for greater production.

FOSDICK ECONOMAX UPRIGHT DRILLS meet the demand for a drill with a capacity between a sensitive and the heavy duty radial. Box column type furnished in any number of spindles from one to six. Also available with round column which is particularly adapted to tool room work. On this type, the table may be swung beyond the base to provide greater distance under the spindle. Controls for Clamping table and heads, and for engaging speeds and feeds are

Quartet in your 1947 Plans





located directly in front of operator to facilitate operation.

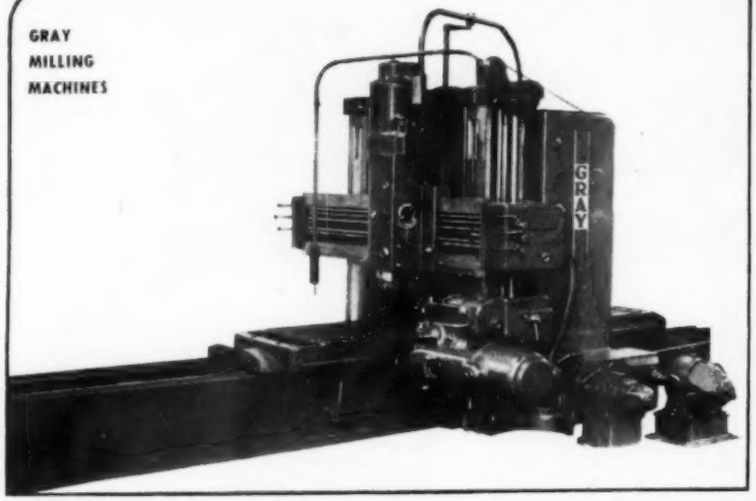
FOSDICK HIGH SPEED DRILLS are furnished in any number of spindles up to six, with various base dimensions to meet job requirements. They are high production machines to meet the need for drilling, reaming, boring, and tapping holes up to 1½" diameter. The wide range of feeds and speeds available gives them unusual flexibility of operation. The counterbalanced head is adjustable on the column to meet varying job requirements.

FOSDICK JIG BORERS are precision tools especially adapted to tool room and tool and die shop work. Illustrated is the new No. 42 with table dimensions of 22x44 inches. No. 30 has an 18x36 inch table. They are rigidly constructed and offer the utmost in precision and low costs, both on short runs and production jobs.

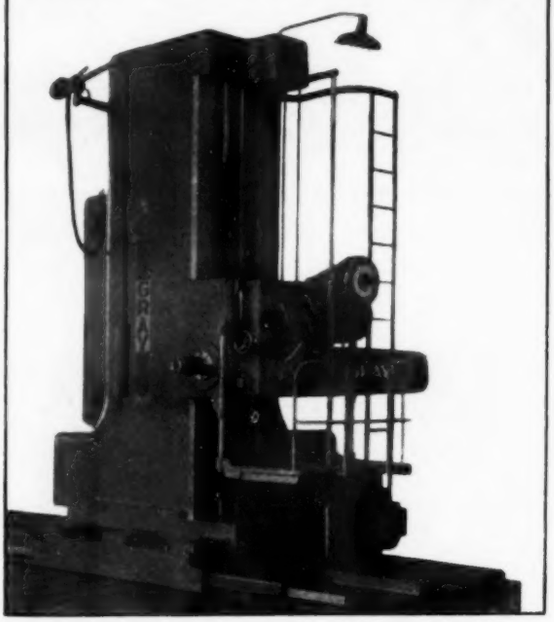
Bulletins available on all machines shown. Write for yours today.

THE Fosdick MACHINE TOOL COMPANY
CINCINNATI 23, OHIO

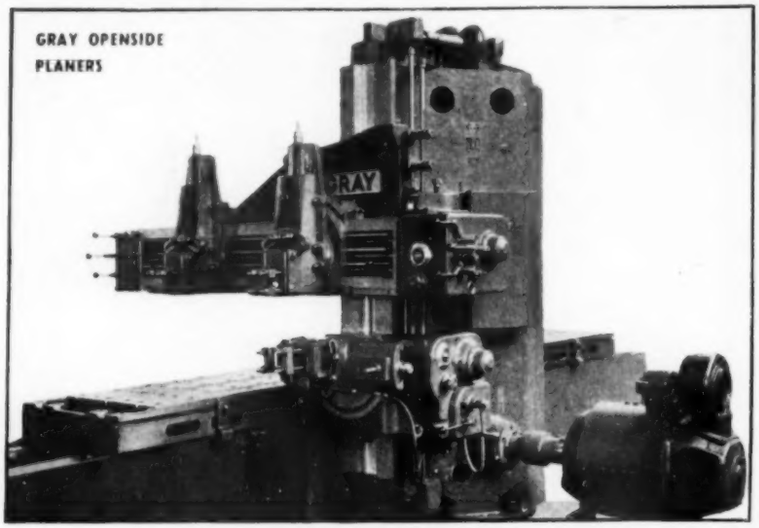
GRAY
MILLING
MACHINES



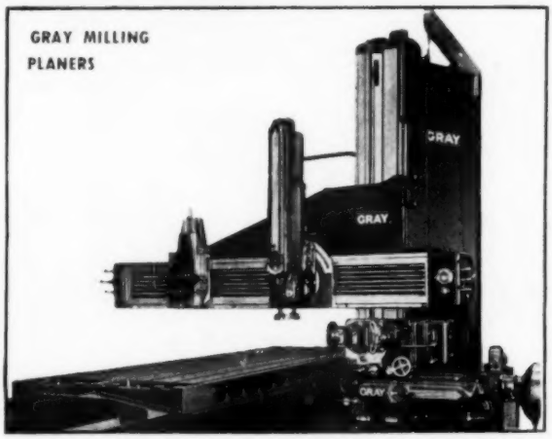
GRAY HORIZONTAL BORING—DRILLING—MILLING MACHINE



GRAY OPENSIDE
PLANERS



GRAY MILLING
PLANERS



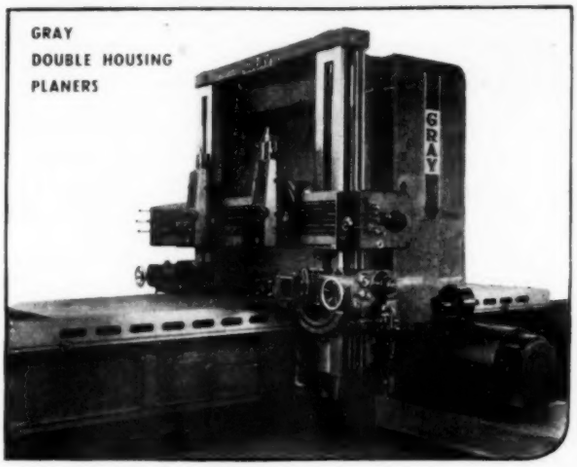
GRAY

MACHINE TOOLS

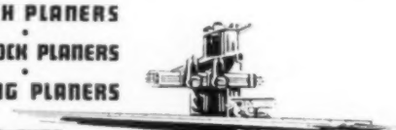
the Standard for Comparison

The G. A. Gray Company has been building machine tools exclusively since 1881. The Gray line here illustrated, reflects the engineering experience and mechanical skill developed through these 64 years of fine machine tool building. Literature sent upon request.

GRAY
DOUBLE HOUSING
PLANERS



DOUBLE HOUSING
and
OPENSIDE PLANERS
•
SWITCH PLANERS
•
DIE BLOCK PLANERS
•
MILLING PLANERS
•
PLANER TYPE
MILLING MACHINES
•
HORIZONTAL
BORING MACHINES



The G.A. GRAY Co.

CINCINNATI 7, OHIO, U. S. A.

SOLD IN CANADA BY UPTON, BRADEEN AND JAMES, LTD. • SOLD IN LATIN AMERICA BY MACHINE AFFILIATES

Bay State, with a new streamlined system of processing orders, 80% more manufacturing space, additional equipment, and new modern facilities for stock, now offers you improved delivery. We have added to our personnel, and appointed several new distributors strategically located to serve you, while our regular distributors have greatly increased their stock of wheels.

Large enough now to meet quickly all your abrasive needs, we are still small enough to give your orders individual attention.

These improved facilities and our usual high quality product warrant a trial.

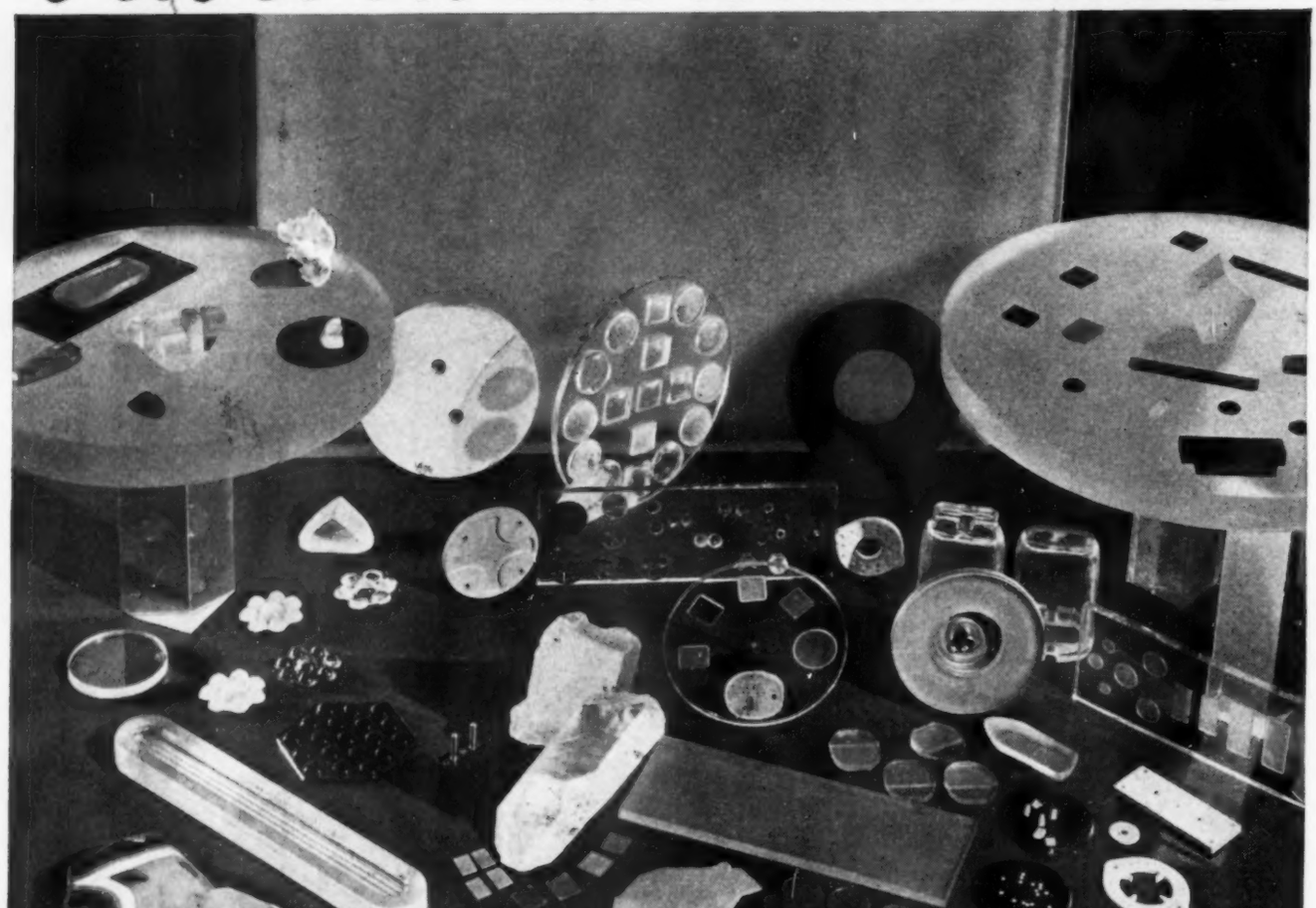
Branch Offices and Warehouses — Chicago — Detroit. Distributors — All principal cities.

BAY STATE

Top Performance Consistently Duplicated

BAY STATE ABRASIVE PRODUCTS CO. • WESTBORO, MASSACHUSETTS, U.S.A.

"Put it on the Blanchard"



All of these pieces—glass, jewels, sapphires, rubies, agate, pyrex, signal glass, quartz prisms and ceramics—were ground on the Blanchard #11 or #18 Grinder. The methods developed for grinding these materials are applicable to many other pieces. We invite inquiries regarding the grinding of these or any unusual materials. Write today and ask for the "Work Done on the Blanchard" book—it will be mailed free.

BLANCHARD

The BLANCHARD MACHINE COMPANY

64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

MO-MAX IS TOUGH AND HARD

IT IS DIFFICULT to exaggerate the value of the ideal combination of **toughness and hardness** found only in MO-MAX. No other high speed steel surpasses MO-MAX in these important qualities. For 13 years MO-MAX has demonstrated its outstanding superiority and economy in every kind of cutting tool.

Check the other "plus" features which MO-MAX alone possesses. Order by brand name from one of the mills listed at the left.

Buyer's Guide to Brands of MO-MAX

"LMW"..... Allegheny Ludlum Steel Corp.
"MOHICAN"..... Atlas Steels Limited
"BETHLEHEM HM".... Bethlehem Steel Co.
"MO-CUT".... Braeburn Alloy Steel Corp.
"STAR MAX".... Carpenter Steel Company
"MOLITE M-1".... Columbia Tool Steel Co.
"REX T-MO" Crucible Steel Co. of America
"DI-MOL"..... Henry Disston & Sons, Inc.
"HI-MO".... Firth-Sterling Steel Company
"REX T-MO"..... Halcomb Steel Company
"MOGUL"..... Jessop Steel Company
"TATMO"..... Latrobe Electric Steel Co.
"MIDMAX".....The Midvale Co.
..... St. Lawrence Alloys, Inc.
"S. T. M."..... Simonds Saw & Steel Co.
"MO-TUNG"..... Universal-Cyclops Steel Corporation
"8-N-2"..... Vanadium-Alloys Steel Co.
"VUL-MO"..... Vulcan Crucible Steel Co.

ONLY MO-MAX GIVES YOU *all* THESE ADVANTAGES

1 MO-MAX has superior cutting qualities. It is a happy combination of great toughness with high hardness.

2 The machinability of MO-MAX is unexcelled, particularly in grinding.

3 MO-MAX is economical. Its specific gravity is about 8% less than that of 18% tungsten steel. Thus for the same weight of high speed steel, 13 bars of MO-MAX are obtained as compared with 12 similar bars of an 18% tungsten steel.

4 In addition to the standard general-purpose composition of MO-MAX high speed steel, several special types have been developed for particular purposes. There are four with a high cobalt content, one high in vanadium and two that are especially suitable for hot die work.

5 MO-MAX was the first of the modern molybdenum high speed steels. For 13 years MO-MAX has demonstrated its superiority in cutting tools.

★ ★ ★

Send for your copy of the MO-MAX Handbook, sixth edition. Get the full story about this remarkable steel, including easy-to-follow instructions on heat treating.

THE CLEVELAND TWIST DRILL COMPANY • 1244 East 49th Street • Cleveland 14, Ohio

DO HARD JOBS THE EASIER WAY...

with Thor

HEAVY-DUTY DRILLS

THOR HEAVY DUTY ½" ELECTRIC DRILL—the original, close-coupled, smaller, lighter half-inch electric drill. No other electric drill of similar size offers such compact power and light weight convenience and high efficiency for continuous service on hard production and maintenance jobs. There's a full range of Thor sizes—*a tool for every need*—all compactly designed, well-balanced and ruggedly built. *For full information ask your nearby Thor Distributor or write for catalog.*

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. Jackson Boulevard, Chicago 6, Illinois

Birmingham Boston Buffalo Cincinnati Cleveland Denver Detroit Houston Los Angeles Milwaukee New York Philadelphia Pittsburgh St. Louis St. Paul Salt Lake City San Francisco Toronto, Canada London, England

Thor **PORTABLE POWER TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

Can Your Shop Equipment Meet Aggressive Competition?

High labor and material costs leave just one road open to manufacturing survival and, therefore, jobs. That road is a step-up in manufacturing efficiency. Coming competition will place business in the shop that can produce quality at lowest cost. That means your equipment must be fast, efficient and accurate.

Accurate, smooth cutting, efficient equipment is Pratt & Whitney's business. That is why so many forward-looking manufacturers are clearing out obsolete machines and tools . . . replacing them with modern P&W equipment that can meet and beat competition. The same reasoning is causing buyers of tools, jigs and fixtures to single out Pratt & Whitney equipped shops as the best sources of supply. They know that the accuracy built into P&W equipment is passed on to the work it turns out.

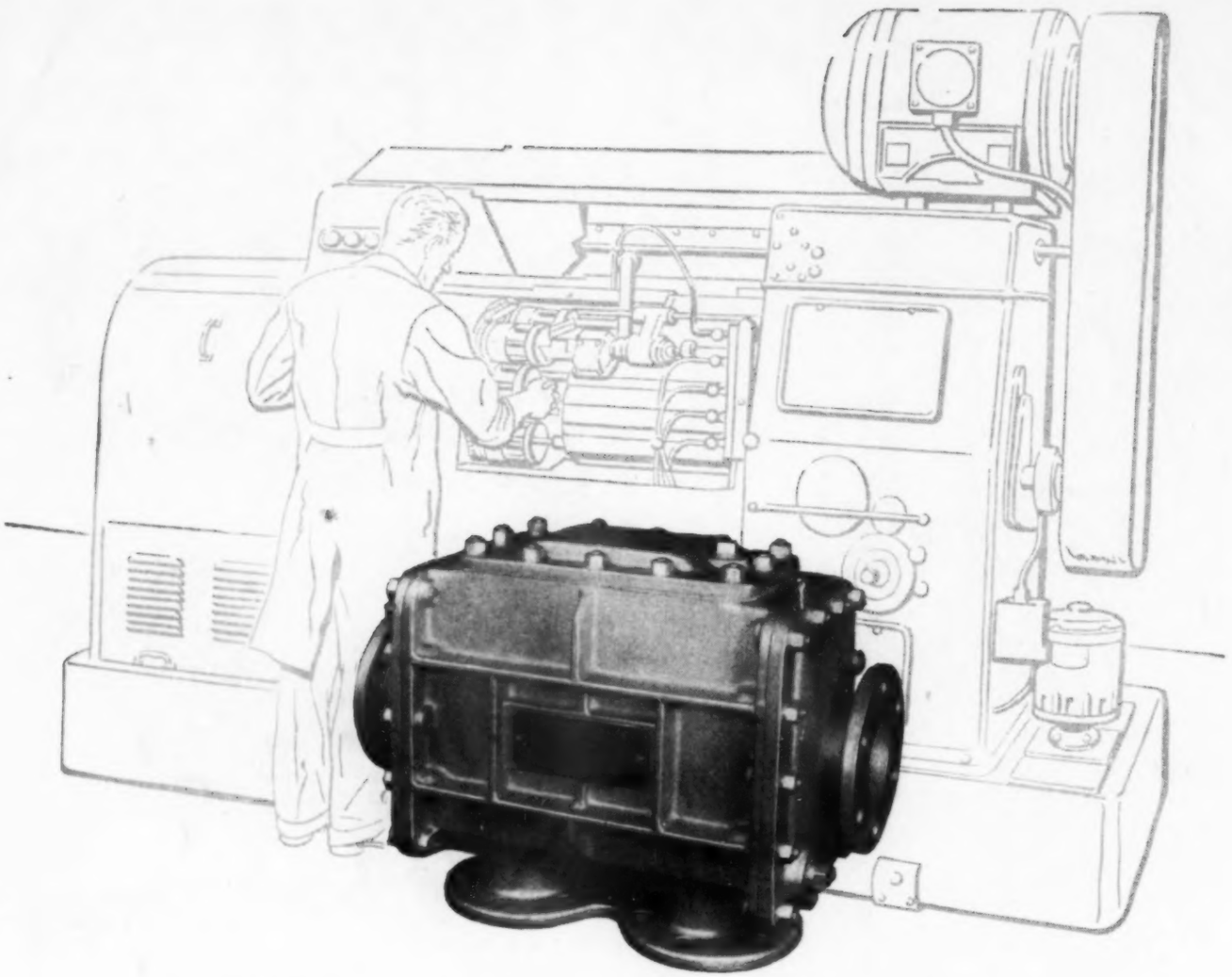
Investigate the potentialities of new Pratt & Whitney equipment in your shop. Our experts are ready to show you just what to expect from our precision machine tools, small tools and gages. Put P&W accuracy to work on your product. It pays dividends.

For a quick look at the entire line of Pratt & Whitney precision products, ask on your company letterhead for a copy of our Condensed Catalogue.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT



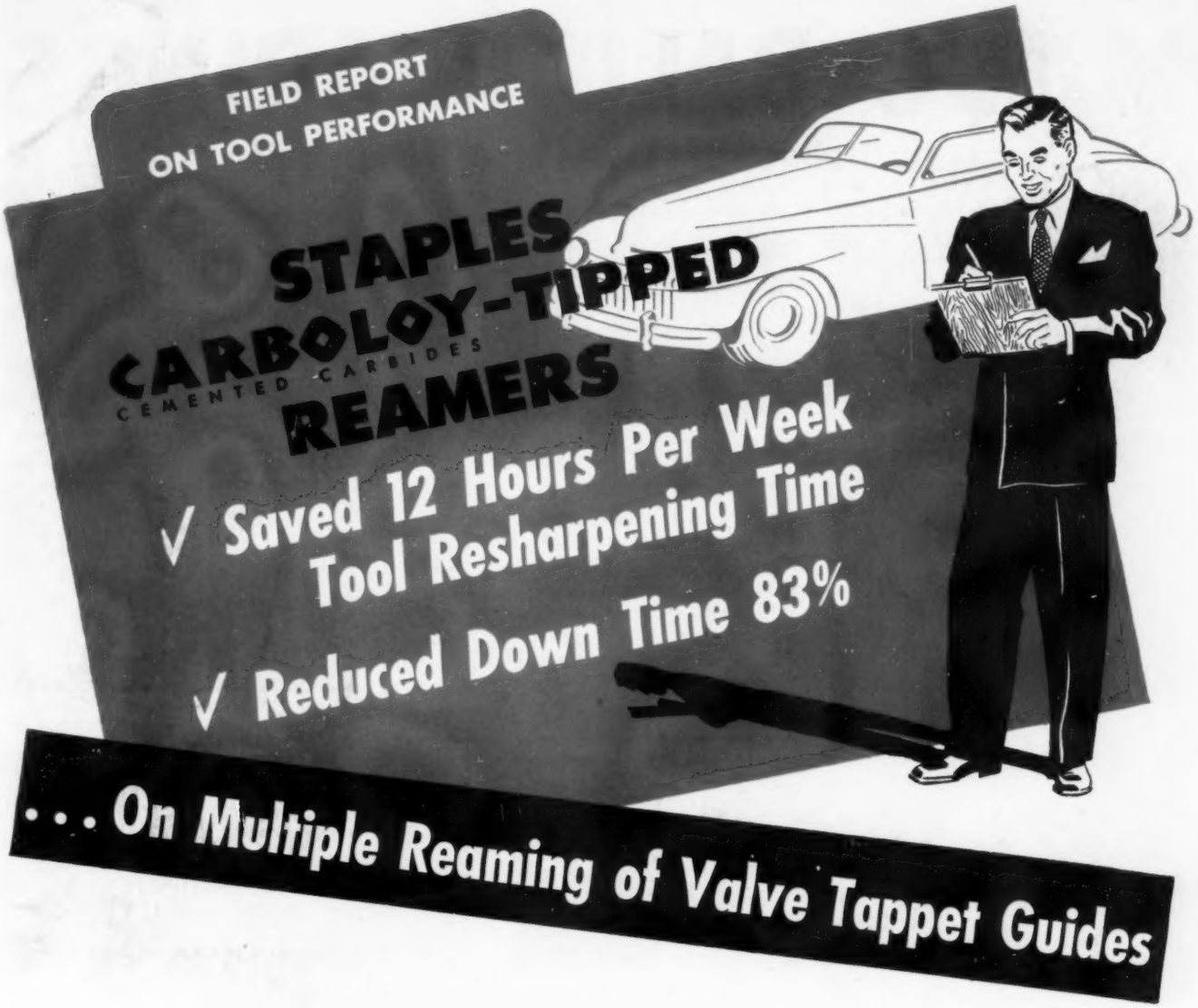
High Production Schedules Call For Harrison Oil Coolers

At no time is proper oil temperature more important than when machines are operating continuously. By keeping oil within the most effective temperature range, Harrison Oil Coolers minimize wear and reduce "down time" required for maintenance.

Harrison Oil Coolers are increasing production efficiency in a wide variety of industrial installations. Compact, sturdy and dependable, they are available in types and sizes to meet practically any requirement.

HARRISON

HARRISON RADIATOR DIVISION OF GENERAL MOTORS, LOCKPORT, NEW YORK



To ream valve tappet guide holes in cylinder blocks, an automotive manufacturer used a multiple tool set-up of six H.S.S. reamers. Eight hours running time was the maximum production rate possible before reamers became dull and required resharpening.

At the recommendation of Staples Tool Engineers, the six H.S.S. reamers were replaced with special Staples Carboloy-tipped Reamers. As a result, tool resharpenings were reduced from five times a week to *once a week!* Prior to this changeover, the manufacturer had accepted the high tool cost as a production necessity on jobs of this type.

By replacing H.S.S.tools with Staples Carboloy-tipped Tools on routine as well as complex hole cutting operations, many manufacturers have reduced tool costs, improved tool performance and have eliminated frequent down time. *Your* production may also benefit. Call in a Staples Tool Engineer for an on-the-job demonstration. There is no obligation.

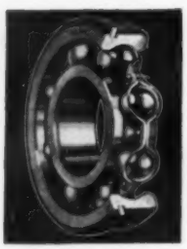
THE STAPLES TOOL COMPANY
CINCINNATI 25 **OHIO**
Distributors in Major Cities

Staples CARBOLOY-TIPPED CIRCULAR CUTTING TOOLS
REAMERS • CORE DRILLS • SPOT FACERS • COUNTERBORES • END MILLS • SHELL END MILLS • ALSO A COMPLETE LINE OF CIRCULAR SPECIAL TOOLS

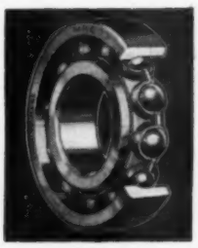
M-R-C BALL BEARINGS

Complete Range of Types for All Requirements

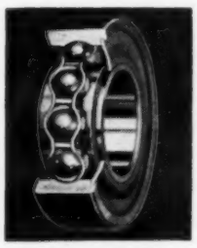
Maximum-Capacity Snap-Ring Type



Super-Conrad Snap-Ring Type

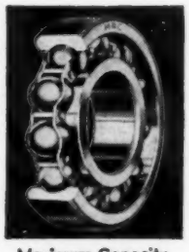


Radial Type R Maximum-Capacity

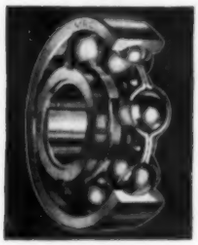


Maximum-Capacity Single-Shielded

Maximum-Capacity Double-Shielded



Maximum-Capacity Notched Type



Adapter Type

Radio-Thrust Angular-Contact

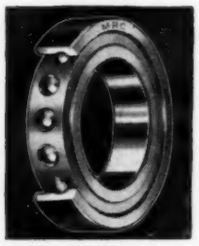
"M-R-C BALL BEARING INTERCHANGEABLE TABLES"

Ball Bearings of Various Makes in Numerical Order and Corresponding Sizes of M-R-C Replacements.

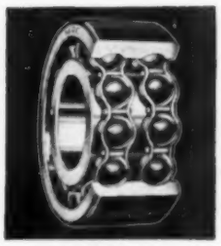
This bulletin contains a list of bearing numbers of over 12,000 different ball bearings made by various American ball bearing manufacturers.

Sent free on request — Ask for Bulletin No. 26

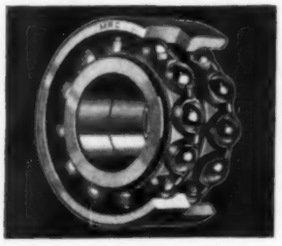
Super-Conrad Snap-Ring Type Single-Shielded



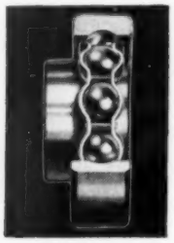
Single-Row Extra-Light Type KR



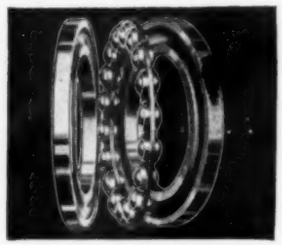
Double-Row Maximum-Capacity Type



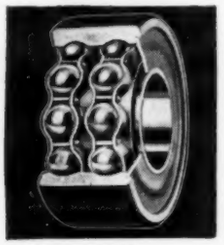
Duplex



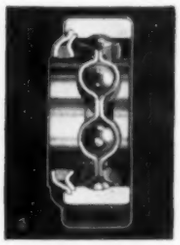
Wide-Inner Bearing



Thrust Bearing Flat Washer Type

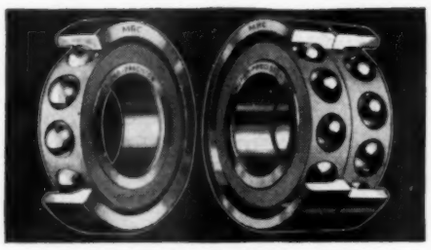


Double-Row Single-Shielded

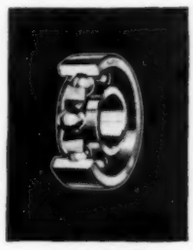


Fabri-Seal Type with Sealing Ring

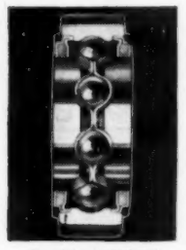
Extremely-Light Inch-Size



Super-Precision Bearings
Single Row Duplex



Extra-Small (Miniature)

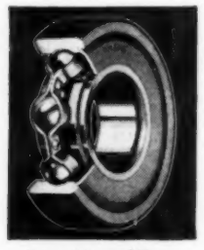


Double Felt-Seal Shielded Both Sides

Narrow-Type Bearing

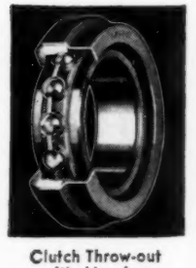
Super-Conrad Deep-Groove Type

Max.-Capacity Snap-Ring Type Single-Shielded



Super-Conrad Type Single-Shielded

Clutch Throw-out Plain



Clutch Throw-out with Housing

MARLIN-ROCKWELL CORPORATION

Executive Offices: JAMESTOWN, N. Y.

This RED BADGE of Merit

IS WELL-EARNED BY ALL PRODUCTS THAT WEAR IT

This "ribbon-etch" marks the products made by the longest-experienced manufacturer of cutting tools. And this mark means these 4 things:

1. It means that the product is made of special steel, usually from Simonds' own modern electric steel mills.

2. It means that the product is fabricated in the world's first windowless plant, where all working conditions are constantly controlled to keep workers' well-being and product-quality at top level.

3. It means that the product has been tested and re-tested to make sure you get full Simonds quality in every order. (There's no "second grade" in this line.)

4. It means that the product is represented, *to you,* by Simonds cutting-tool engineers... and by distributors and dealers . . . whose engineering judgment and sales counsel is as sound as the product itself.

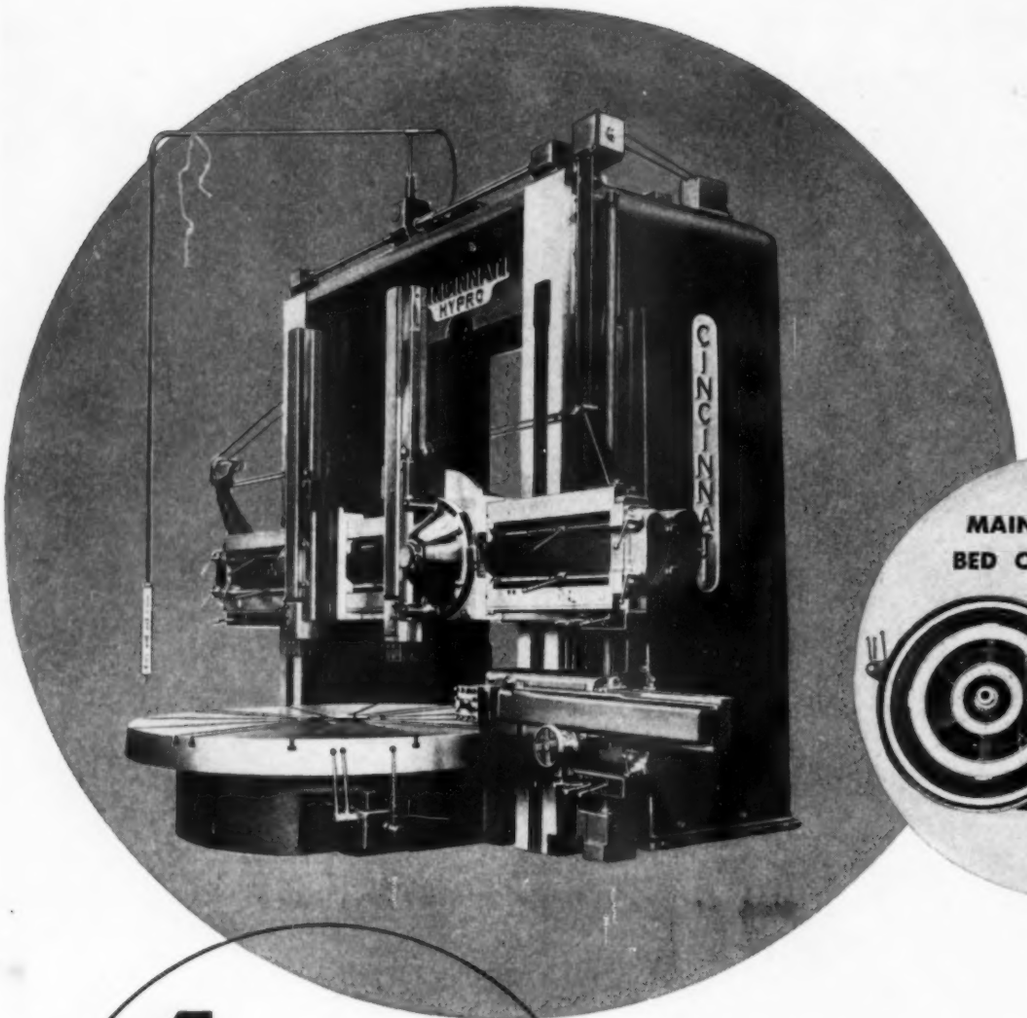
And wherever this mark appears in *your* operations, *it will mark a deep cut in your cutting costs.*

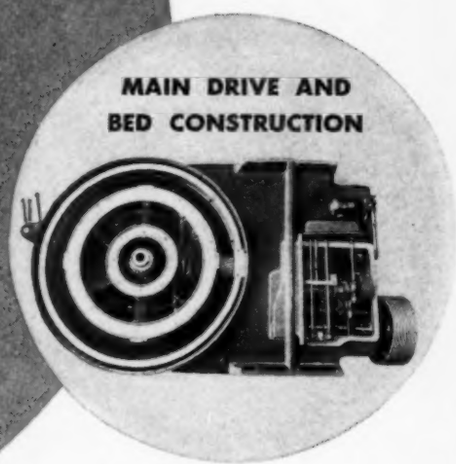
SIMONDS CUTS YOUR CUTTING COSTS ON METAL, WOOD, PAPER, PLASTICS

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.
Other Divisions of SIMONDS SAW AND STEEL CO. making Quality Products for Industry

SIMONDS STEEL MILLS — Special Electric Furnace Steels
SIMONDS ABRASIVE CO. — Grinding Wheels and Grains
SIMONDS CANADA SAW CO. LTD. — Simonds Products for Canada

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Ave., Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Washington. *Canadian Factory:* 595 St. Remi St., Montreal 30.





4 MORE GOOD REASONS FOR THEIR AMAZING PERFORMANCE

CINCINNATI HYPRO Boring Mill

10-FOOT — 12-FOOT

1. One piece speed box and bed construction, providing rigidity and preventing misalignment of shafts
2. Hardened steel forged gears mounted on multiple splined shafts running in anti-friction bearings
3. Anti-friction bearing table mounting with 3 load carrying tracks; outside track nearly full diameter of table
4. Automatic pressure lubrication to all units and parts interlocked with main drive motor

THE CINCINNATI HYPRO PLANER COMPANY

PLANERS · BORING MILLS · PLANER TYPE MILLERS

CINCINNATI, OHIO

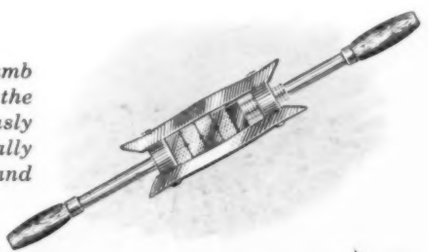
Metal Worker...in 1872

The town blacksmith was the leading metal-worker in 1872, the year GTD "Greenfield" was born. And a mighty man he had to be in order to worry a thread onto a piece of metal with that primitive threading tool—a "jamb plate" *. Working to tolerances of perhaps a sixty-fourth of an inch, the metal-worker of 1872 would be amazed at the accuracy of modern "Greenfield" threading tools, measured in ten thousandths of an inch.

The history of the Greenfield Tap and Die Corporation during the past 75 years has been the history of the development of ever finer and more accurate threading tools to serve industry.

GTD Greenfield 75th YEAR

Forerunner of modern threading tools, the "jamb plate" was a crude vise-like tool that clamped onto the piece of metal to be threaded. It was then laboriously twisted back and forth until a thread was actually "jammed" onto the metal. It was slow, hard work and the results were haphazard.



GREENFIELD TAP and DIE CORPORATION
Greenfield · Massachusetts

The GEOMETRIC TOOL COMPANY
New Haven, Connecticut · In Its Fifty-Fourth Year
A DIVISION OF GREENFIELD TAP and DIE CORPORATION

"GEOMETRIC" DIE HEAD — STYLE D... One of the more popular styles of "Geometric" Self-Opening Die Heads. Cuts standard threads including large diameters and coarse pitches. Chasers are heavy and sturdy with plenty of metal back of cutting point. This head, in ¾" size or larger, has a roughing and finishing attachment, making possible the use of two cuts where necessary. Also threads close to a shoulder. Write for details and prices.

Backing GEOMETRI Threading Tools...

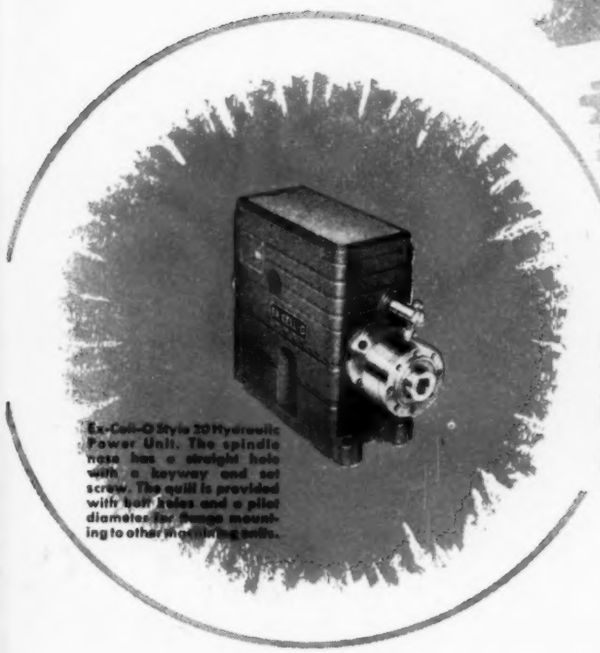
The largest and most modern plant in the world devoted exclusively to the manufacture of Die Heads, Collapsing Taps and Chasers is backing Geometric Tools. Their precision is the result of Geometric's high manufacturing standards and the constant development and adoption of better methods of threading tool production.

Part of the Geometric plant is shown here, with New Haven's historic West Rock in the background — a true symbol of the rugged strength and stability of Geometr products, which have been manufactured in this sa location for over fifty years. Geometric cordially w comes visitors to visit this up-to-date plant and see f themselves how modern threading tools are made.

Have you a copy of the new Geometric "Screw Thread Cutting Manual"? It is the most complete compilation of information about the proper use of die heads and collapsing taps ever published. We will be pleased to send you a copy on request on your company letterhead.

THE
GEOMETRIC
TOOL COMPANY · NEW HAVEN 15, C
A Division of Greenfield Tap and Die Corporation

It's New! It's Small! It's Hydraulic!

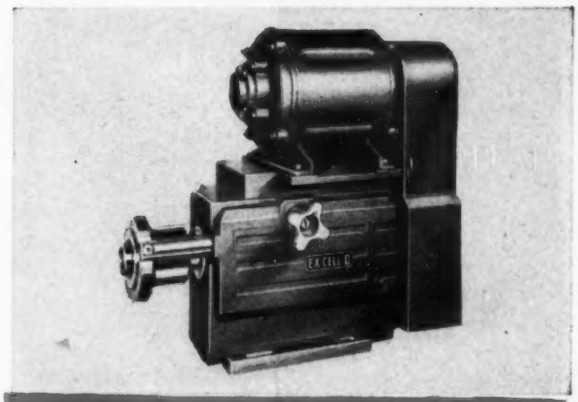


Ex-Cell-O Style 20 Hydraulic Power Unit. The spindle nose has a straight hole with a keyway and set screw. The quill is provided with four holes and a pilot diameter for flange mounting to other machining units.

EX-CELL-O Style 20 Hydraulic Power Unit for High Spindle Speeds and Fast Operating Cycles . . .

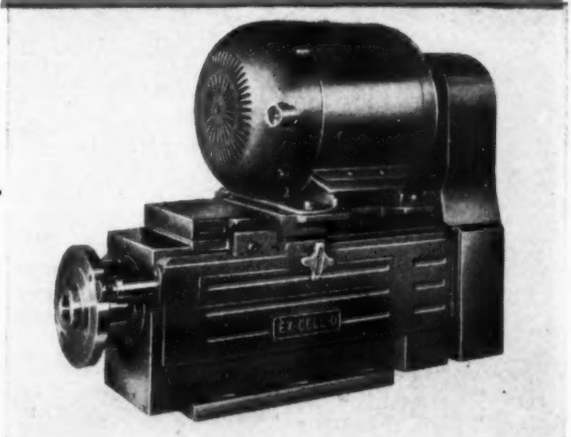
Ex-Cell-O's Style 20 Hydraulic Power Unit is designed for the high spindle speeds required for operating small diameter tools efficiently. It is built to stand up under continuous, fast operating cycles. The automatic cycle includes rapid approach, two infinitely variable dial adjustable feed rates, and rapid return and stop. The unit is arranged for electric start and emergency return control.

All Ex-Cell-O Hydraulic Power Units are easily installed; easily rearranged when production needs change. As a result, it is possible to use the units over and over again, and spread the original cost through years of operation. The units require minimum maintenance; ordinarily, the only care necessary is the replenishing of the hydraulic oil.



TWO OTHER SIZES—MEDIUM AND LARGE

Ex-Cell-O makes two other size hydraulic power units—(above) Style 21 (over-all length, without guard, 22¼") and (below) Style 28-A (over-all length, without guard, 38¼"). They are compact and self-contained for ease in installation. They have infinite feeds for proper cutting and provide ample power for multiple-head operation. Contact your local Ex-Cell-O representative today to see how Ex-Cell-O Power Units fit into your production program.



47—2

XLO

EX-CELL-O for PRECISION

Ask For This FREE Book Now!

New Ex-Cell-O Bulletin gives full details on all Ex-Cell-O Hydraulic Power Units. Shows how they can be profitably applied to your production problems. Write for a copy today . . . ask for Bulletin No. 45361.

EX-CELL-O CORPORATION

DETROIT 6 MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CONTINENTAL CUTTING TOOLS • MISCELLANEOUS PRODUCTION PARTS • FUEL INJECTION EQUIPMENT • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • PURE-PAK PAPER MILK BOTTLE MACHINES

CARBIDE AT ITS BEST . . . . .

GET MAXIMUM CARBIDE EFFICIENCY

WITH SUPER EJECTOR-TYPE TOOL

Replaceable Carbide Bit is held without strain of any sort, permitting it to really go to work—with results never before obtained.

You get longer life . . . more work . . . much greater resistance to chipping, cracking, checking . . . no loss of efficiency after re-grinds . . . less than half the loss of Carbide when re-sharpening . . . lower grinding wheel costs, etc.

You are losing money every day you run without this tool.

Write for particulars, or call our local representative.

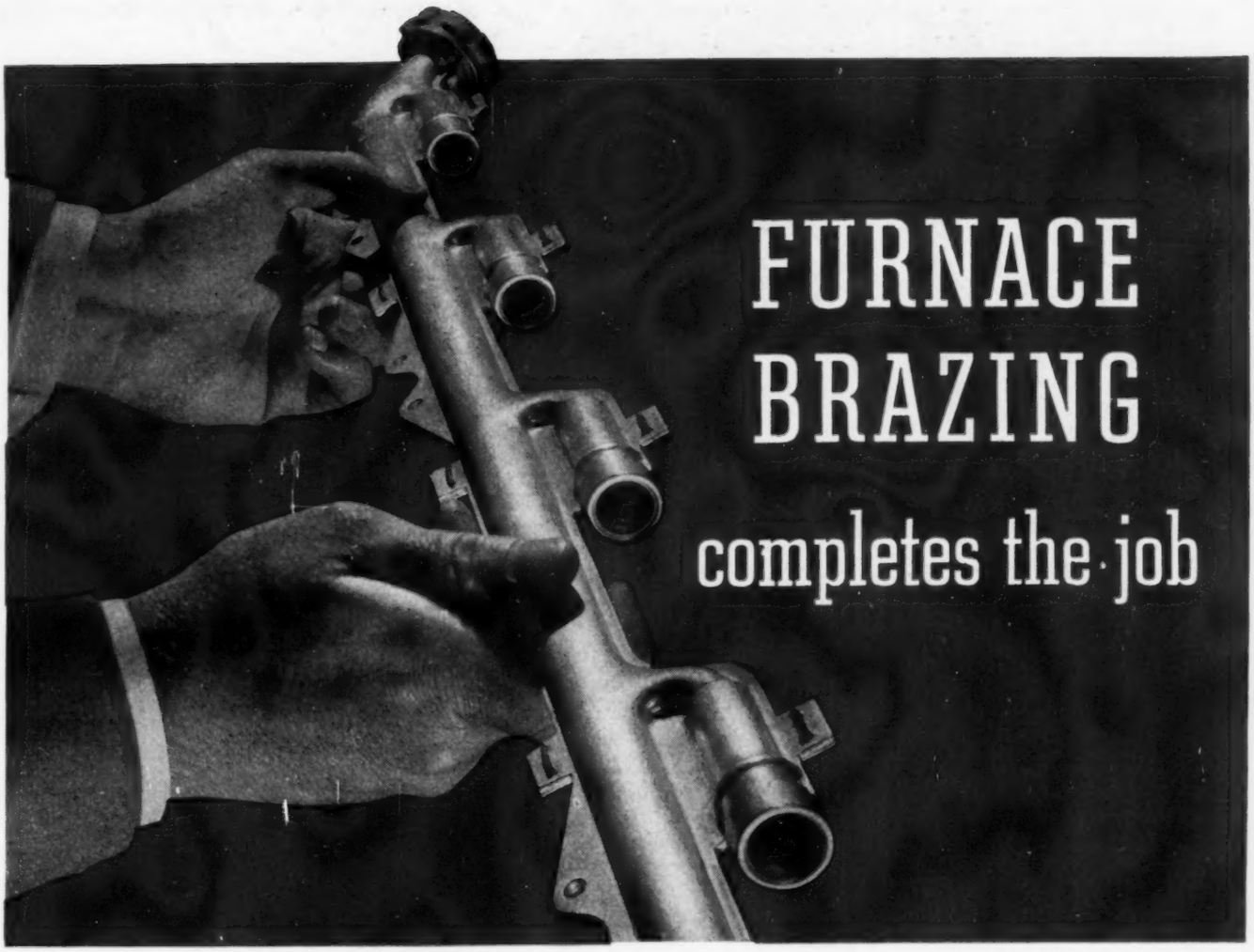
Carbide Tipped Tools

For Turning • Facing • Reaming • Spotfacing • Forming
Wear Parts • Boring • Milling • Drilling • Counterboring
Shaving • Centers • Grinder Rests • Special Purposes

SUPER TOOL COMPANY

Carbide Tipped Tools

21650 Hoover Rd., Detroit 13, Michigan ★ 5210 San Fernando Rd., Glendale 3, Calif.



The two halves of this cable conduit are stamped out of Alcoa Aluminum Brazing Sheet. Placed face to face, the pipe couplings are added, and the assembly is held tightly together. Then into the furnace it goes, to be brazed into a solid unit . . . a quick, simple operation.

This part is made of a heat-treatable Alcoa Aluminum Alloy. It is quenched right from the brazing furnace, giving the necessary stiffness and strength. Thus, they avoid a reheating operation, further cutting the cost of production.

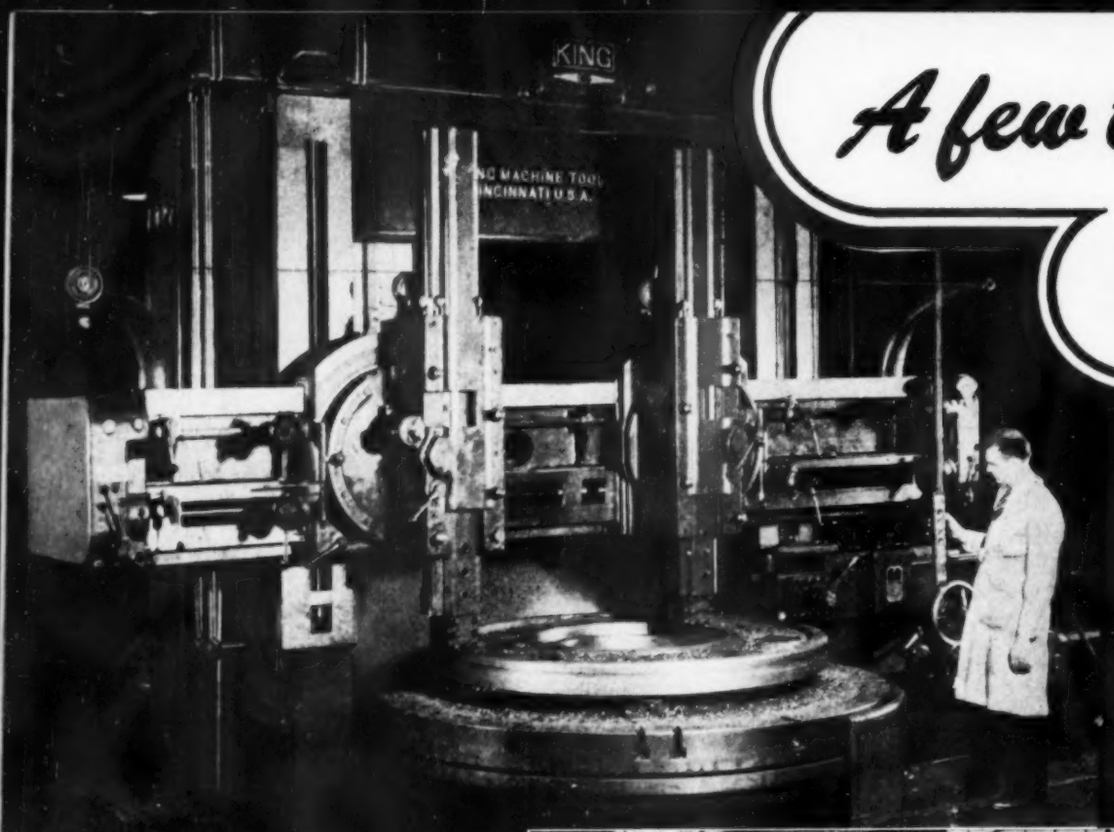
If you need information or help on furnace-brazing the things you are making of aluminum, write to ALUMINUM COMPANY OF AMERICA, 2107 Gulf Bldg., Pittsburgh 19, Pennsylvania, or telephone our nearest sales office.

MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

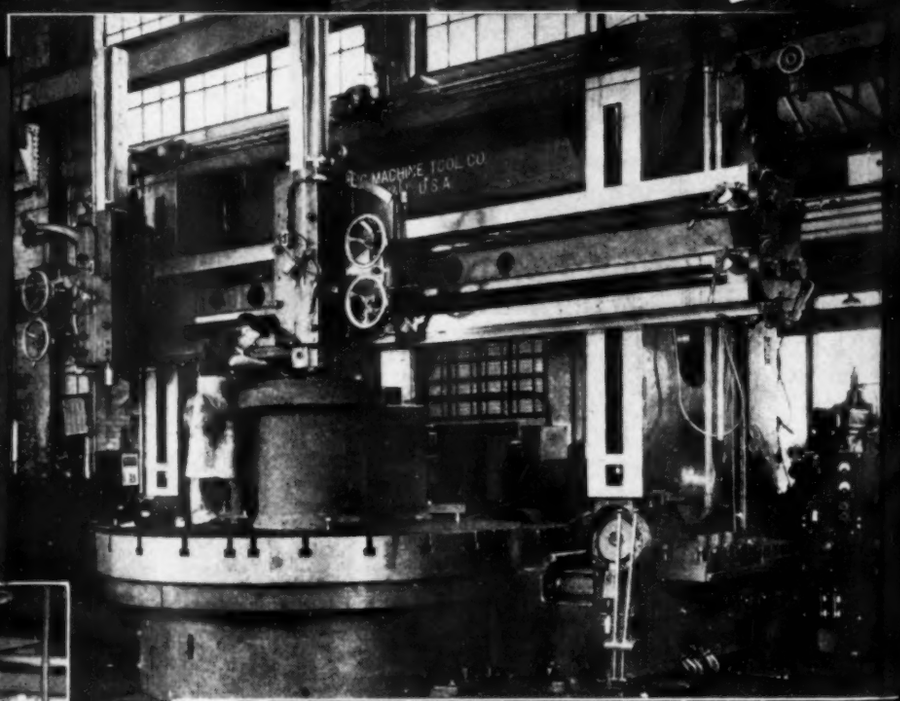
A few typical Boring



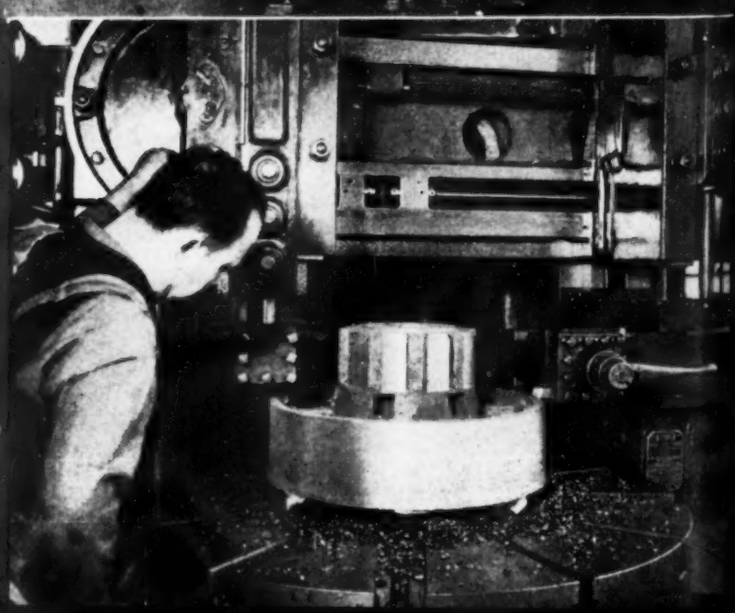
1

2

1. 100" King turning and facing large rings.
2. King 10 foot machine boring large casting. Note machine extended to 12 foot swing.
3. King single column machine boring center hole to close tolerances.
4. King turning and facing special nickel alloy casting for forging machine.
5. King using special forming tool for facing tire mold with L. H. head and performing turning operation with R. H. head.
6. King performs boring and facing operation simultaneously on frame.
7. King using special forming tool and turning top section of tire mold at same time.



3



4

shots of KING *Vertical & Turning Machines . . . . .*

ILLUSTRATING WIDE RANGE OF WORK HANDLED

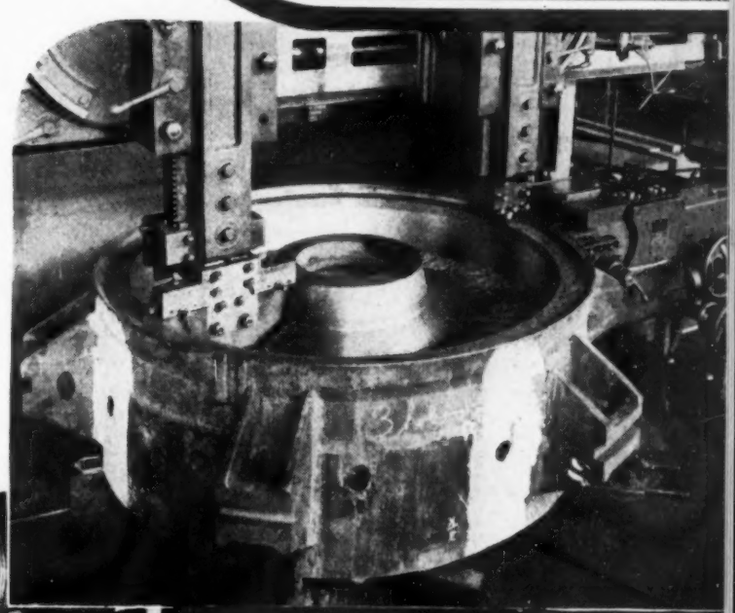
● This group of King Vertical Boring and Turning machines in operation will give you some idea of how the various industrial plants are meeting production problems with King machines.

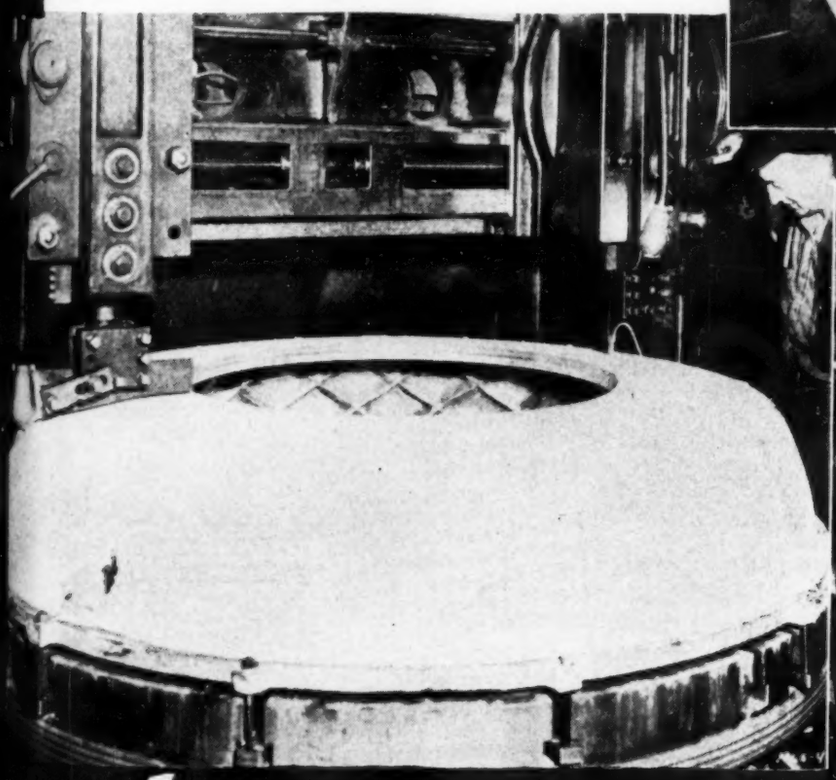
The plants in which these machines are operating include machine tool, electric motor, tire manufacturers, general industrial and so on.

The wide variety of operations shown is evidence of the ability of King Boring machines to meet your turning, boring and facing problems.

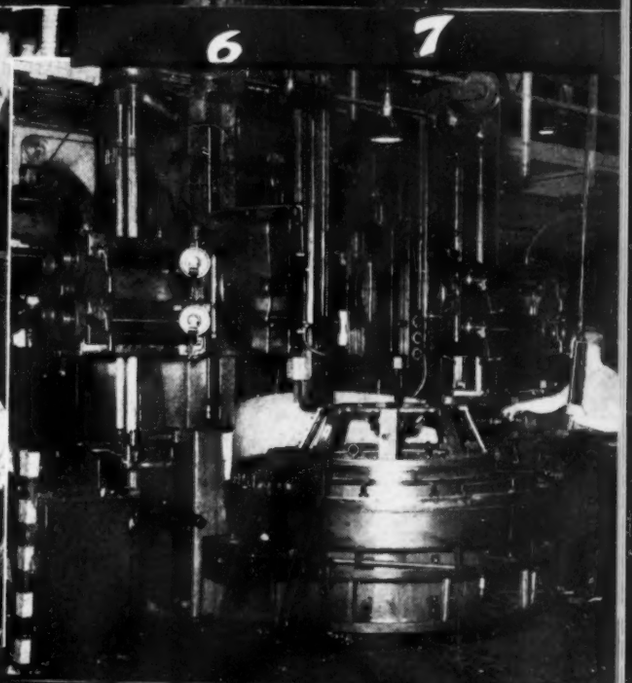
Full details of the New Series King Vertical Boring & Turning Machines available.

Write for bulletin.





5



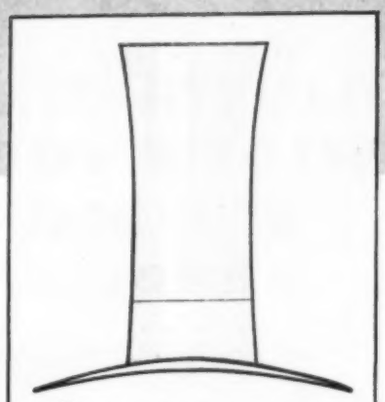
6 7

THE KING MACHINE TOOL COMPANY

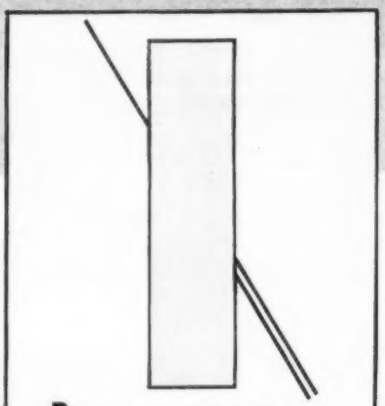
CINCINNATI 29, OHIO

Builders of Vertical Boring and Turning Machines Exclusively

How is Your "Eye Cue" on Measurements?



A. How does the vertical dimension compare with the horizontal?



B. Which oblique line on right is a prolongation of that on left?

C. What size is this Socket Screw?

A surprising number of seasoned shop men discovered that eye cues to sizes are not always reliable. In several tests made recently, many failed to identify the correct size and thread pitch of the socket screw above. Ordinarily these men don't guess . . . they take the sure but slow way of gauging or "miking".

Now...they're sure at a glance . . .

WHEN IT'S SIZE-MARKED

This unique improvement appears on the head of every P-K Socket Head Cap Screw. It saves time by eliminating gauging or "miking" and removes every possibility of error.

At the tool crib, left-over mixed-up screws are quickly identified and replaced in the right bins. Correct sizes are issued to assembly line workers – speeding up their work. New help learns screw sizes faster – works faster.

AN EXTRA SALES FEATURE, TOO. Service men in the field recognize its time-saving advantages on re-assembly jobs.

Plus ANOTHER IMPROVEMENT – GEAR GRIP*

This firm gripping surface prevents slips and slow-downs for fast fingers, even when oily. Only P-K offers Socket Head Cap Screws with both features. Write for samples, today. Parker-Kalon Corp., 200 Varick Street, New York 14, N. Y.

ANSWERS: **A. The same B. The lower one**
C. When it's P-K Size-Marked, there's never a question!

ANOTHER P-K FIRST!
***Ground Thread* Socket Set Screws**

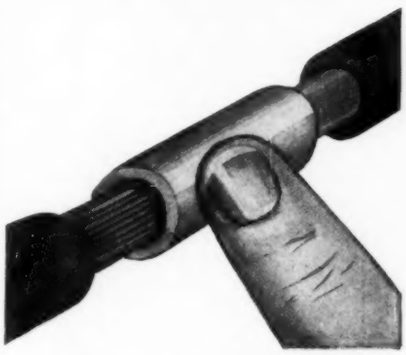
• Threads are ground on pre-hardened stock by a newly developed centerless grinding method. The results . . . a smoother, brighter, cleaner finish, free from imperfections common to ordinary cut thread set screws; faultless thread contour and dependable Class 3 Fit. They look better . . . start better. Write for samples.

P-K SOCKET SCREWS ARE AVAILABLE FOR PROMPT DELIVERIES

*U. S. PAT. No. 126,409

SOLD ONLY THROUGH ACCREDITED DISTRIBUTORS

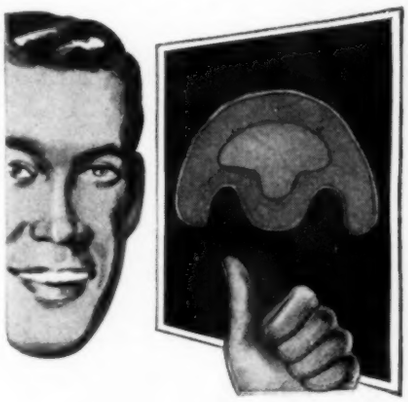
PARKER-KALON *Cold-forged* SOCKET SCREWS



Yes, It's A New Method now used on many of our motors to make winding connections *uniform,* mechanically and electrically. How it works: First, we remove insulating varnish from wire ends by a special process. The bright wire ends are then slipped into this tinned-copper connector. There's no twisting, scraping, unnecessary bending.

Then . . . With A Special Tool, we compress — actually "bond" together — each wire and connector into a homogeneous mass. Every connection is precisely the same as every other . . . no brazing or soldering is used . . . no chance to weaken wires or damage insulation. Wires can't pull out or break-off.

Finally . . . We Slip A Tough, flexible plastic protective tubing over the complete connection. Result: when stator windings are impregnated with insulating varnish and baked out, every connection is uniformly sealed and insulated . . . making a stronger . . . more compact and efficient job . . . another factor demonstrating A-C quality.



Here's An Actual Cross Section microphoto that shows, better than I can tell you, just what happens inside the connection itself. Notice how connector and wires are "bonded" into a single mass. Every connection has precisely the same electrical capacity, assuring balanced phasing.

A-C Builds "Quality" Into Motors

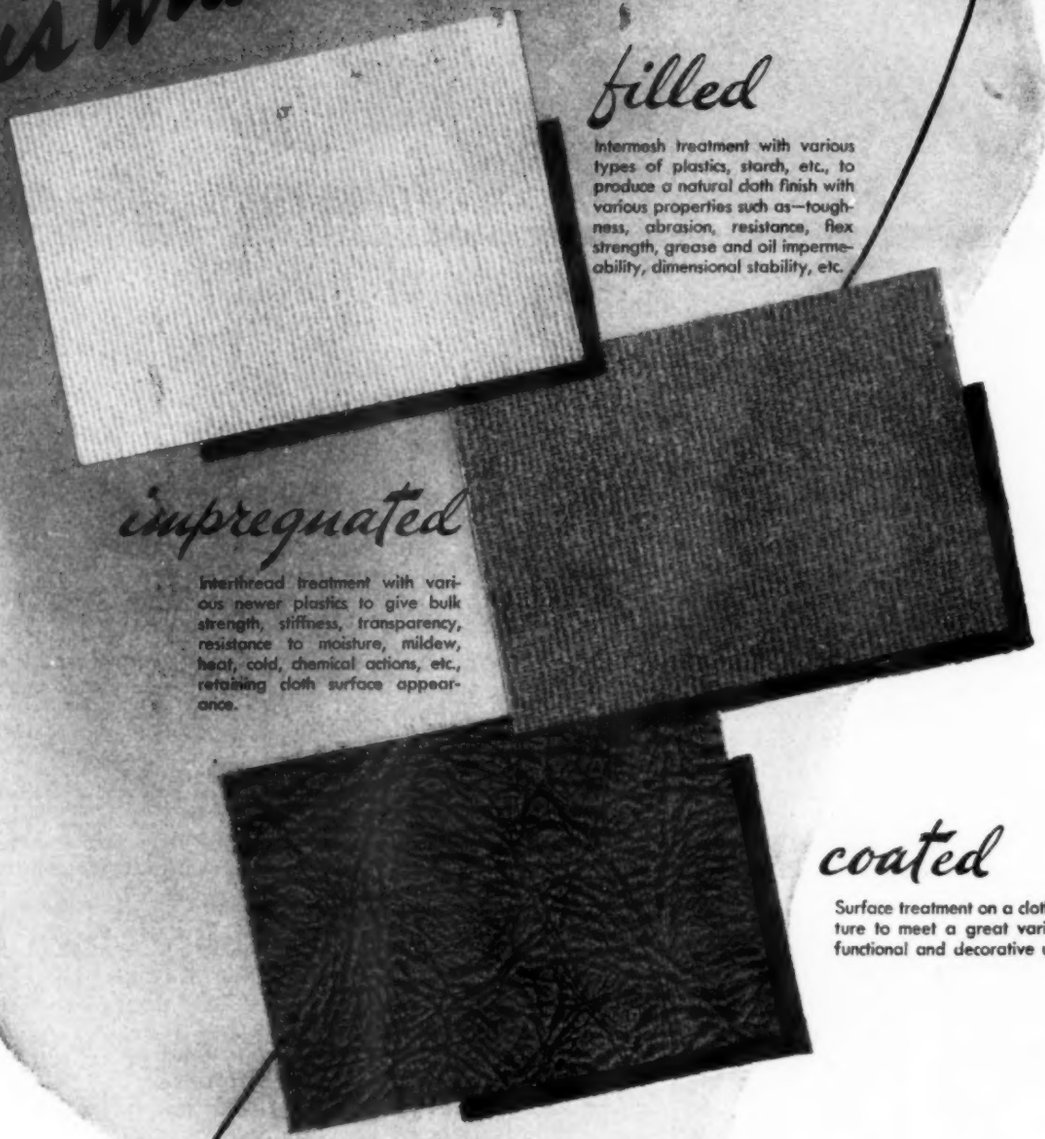
YES, PAYING ATTENTION to details like this new, improved connection contributes importantly toward greater reliability, better performance in motors. Next time you want *good* motors, liberally designed, and with an earned reputation for standing up year after year under toughest operating conditions, specify "Allis-Chalmers". For the complete story call your nearby A-C motor dealer or A-C sales office. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A2147

ALLIS CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

CLOTH *is what we make it*



filled

Intermesh treatment with various types of plastics, starch, etc., to produce a natural cloth finish with various properties such as—toughness, abrasion, resistance, flex strength, grease and oil impermeability, dimensional stability, etc.

impregnated

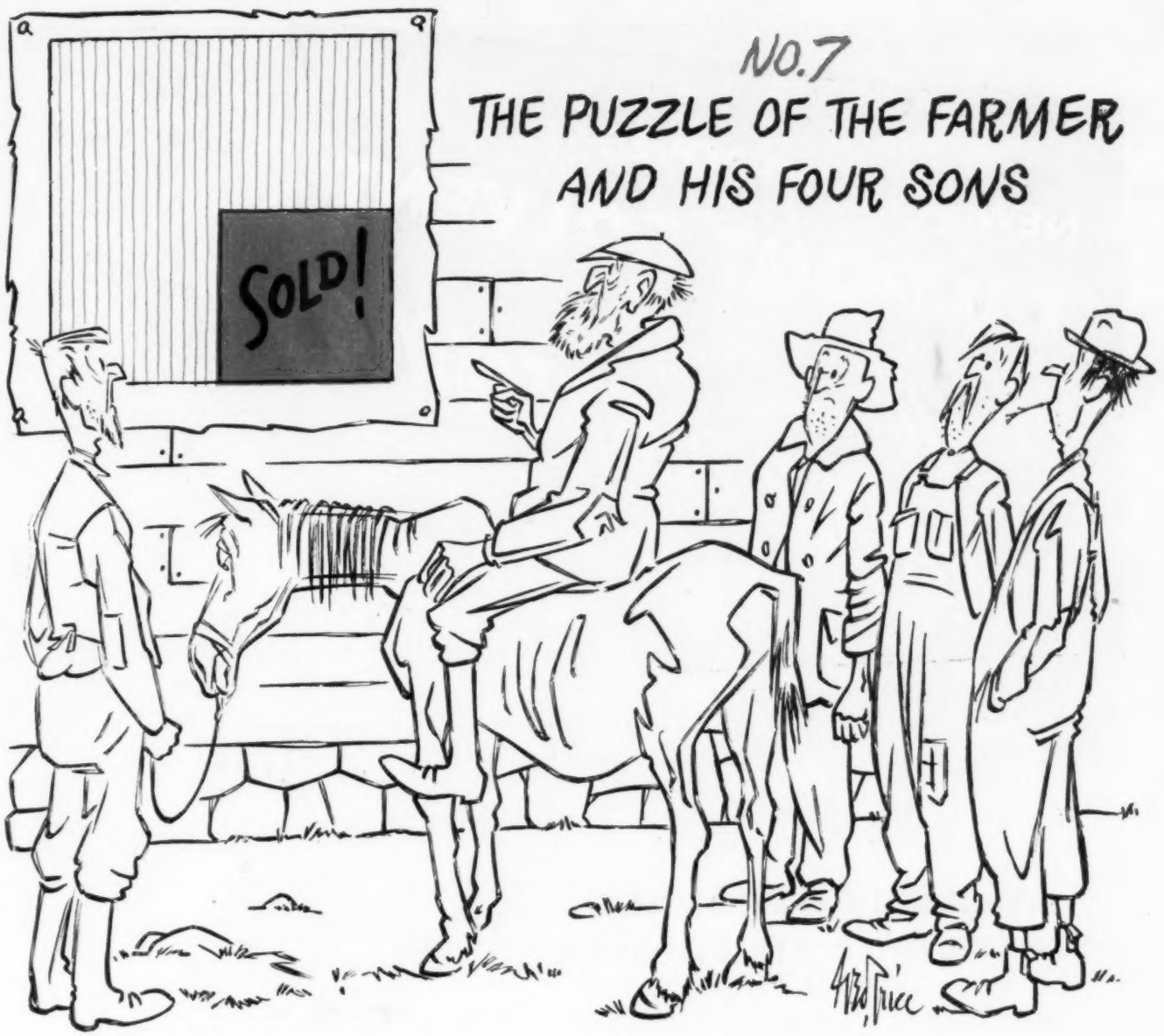
Interthread treatment with various newer plastics to give bulk strength, stiffness, transparency, resistance to moisture, mildew, heat, cold, chemical actions, etc., retaining cloth surface appearance.

coated

Surface treatment on a cloth structure to meet a great variety of functional and decorative uses.

HOLLISTON
Special Purpose Fabrics

THE HOLLISTON MILLS, INC., NORWOOD, MASSACHUSETTS



A farmer had a square piece of land which he wished to divide equally between his four sons. But hard times fell on him, and he was forced to sell one quarter of the land. . . . How did they divide the remaining three-fourths so that each of them boys of his'n had an equal share, and all four tracts were exactly the same shape?

In these days of puzzling cost shifts and hard times a-coming, that farmer's dilemma is duck soup compared to most production problems.

The chances are that turning accounts for 25 per cent or more of all the machining time in your plant — the chances are that this is your major production expense.

There are cases in our files of savings of hundreds of dollars a month in the manufacture of a single part by the use of Jones & Lamson machines. Our Turret Lathes and Fay Automatic Lathes are designed specifically for the most efficient use of carbide tools.

Be skeptical of the production efficiency of all metal turning equipment in your plant.

Telephone or write for a Jones & Lamson engineer who will be glad to consult with you on all phases of your metal turning problems.

JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.

Manufacturer of: Universal Turret Lathes • Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical-Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies •

AVAILABLE NATIONALLY THROUGH DISTRIBUTORS!

UNDER VARIOUS TRADE NAMES, Du Pont Trichlorethylene and Perchlorethylene solvents for metal cleaning have served American industry successfully for many years. If you have used vapor degreasing solvents in your plant, no doubt you have used these solvents made by Du Pont.

NOW Du Pont has developed *new and improved* Trichlorethylene and Perchlorethylene — the same fine solvents, but BETTER THAN EVER, thanks to various technical improvements. These are the best Vapor Degreasing solvents we've ever made—the best we know how to make. Use them with complete confidence and assurance for all metal degreasing work. We believe they'll serve you *better!*

LOOK TO the service offered by Du Pont and by distributors of solvents of Du Pont manufacture to help you attain the utmost in effective and economic use of these materials. Send today for your copy of our new free book, "Metal Degreasing—Standard Practices."

• • •

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
WILMINGTON 98, DELAWARE

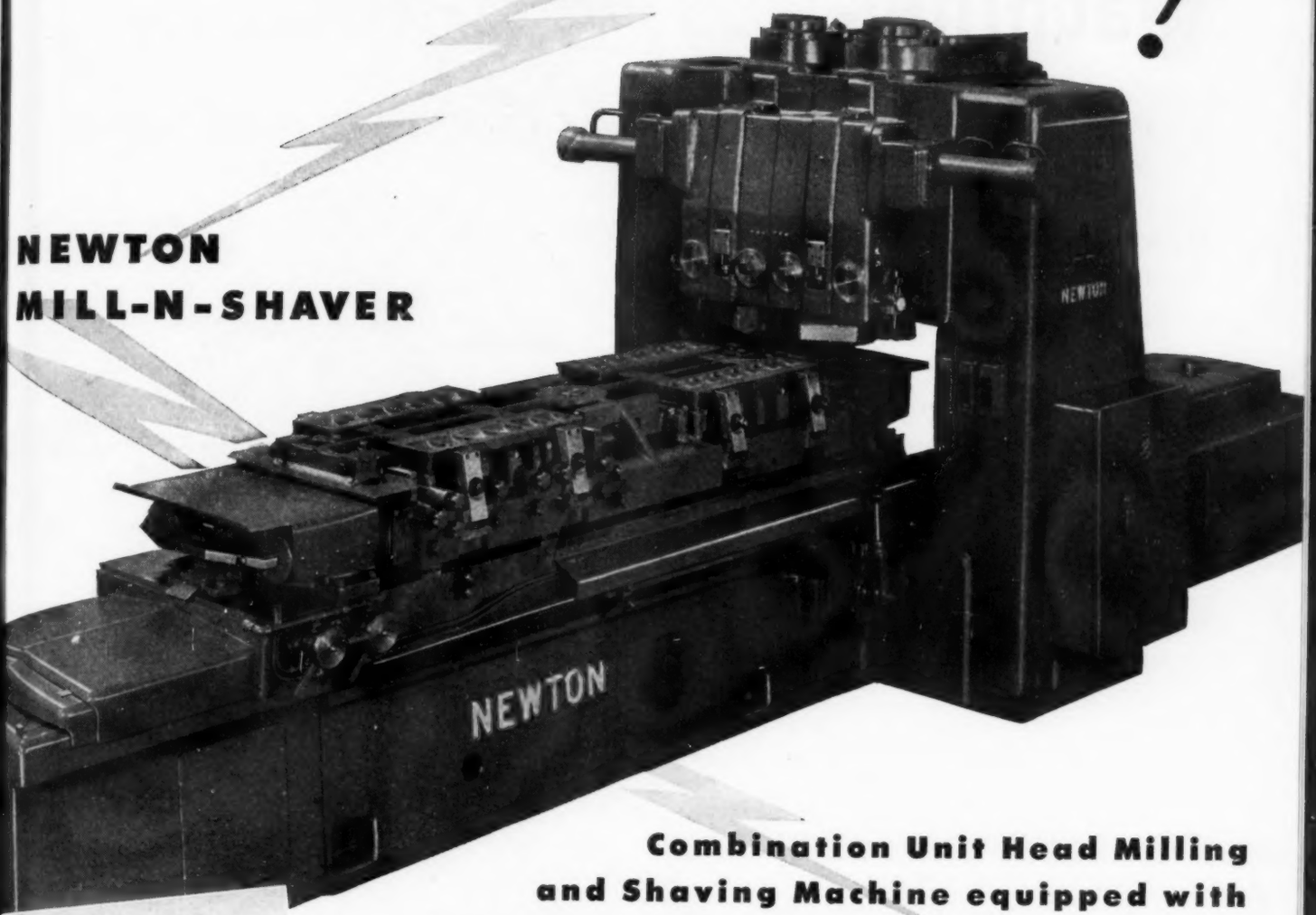
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

DU PONT

REG. U. S. PAT. OFF.

DU PONT SOLVENTS

TWO SEPARATE OPERATIONS in the time required for rough milling—alone



NEWTON MILL-N-SHAVER

Combination Unit Head Milling and Shaving Machine equipped with two single vertical milling heads and two finish shaving heads. Hydraulic feed to table.

The Newton Mill-N-Shaver performs two complete operations at one pass of the table. It rough mills at milling speed and finish shaves on the return, at the rapid traverse speed. This machine produces a perfect gasket surface. Two separate operations in exactly the time ordinarily required for rough milling alone. The Newton Mill-N-Shaver is designed to both step-up your production and reduce your costs on the types of work for which this machine is adapted. For detailed information, write for Bulletin No. 580.

Among Heavy Machine Tools built by Consolidated are . . . .

LATHES
BORING MILLS
DRILL PRESSES
MILLING MACHINES
BORING MACHINES
COLD SAW MACHINES
PLANERS
SLOTTERS
RAILROAD SHOP TOOLS
AUTOMOTIVE TOOLS
AND OTHER
SPECIAL MACHINES

BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1861

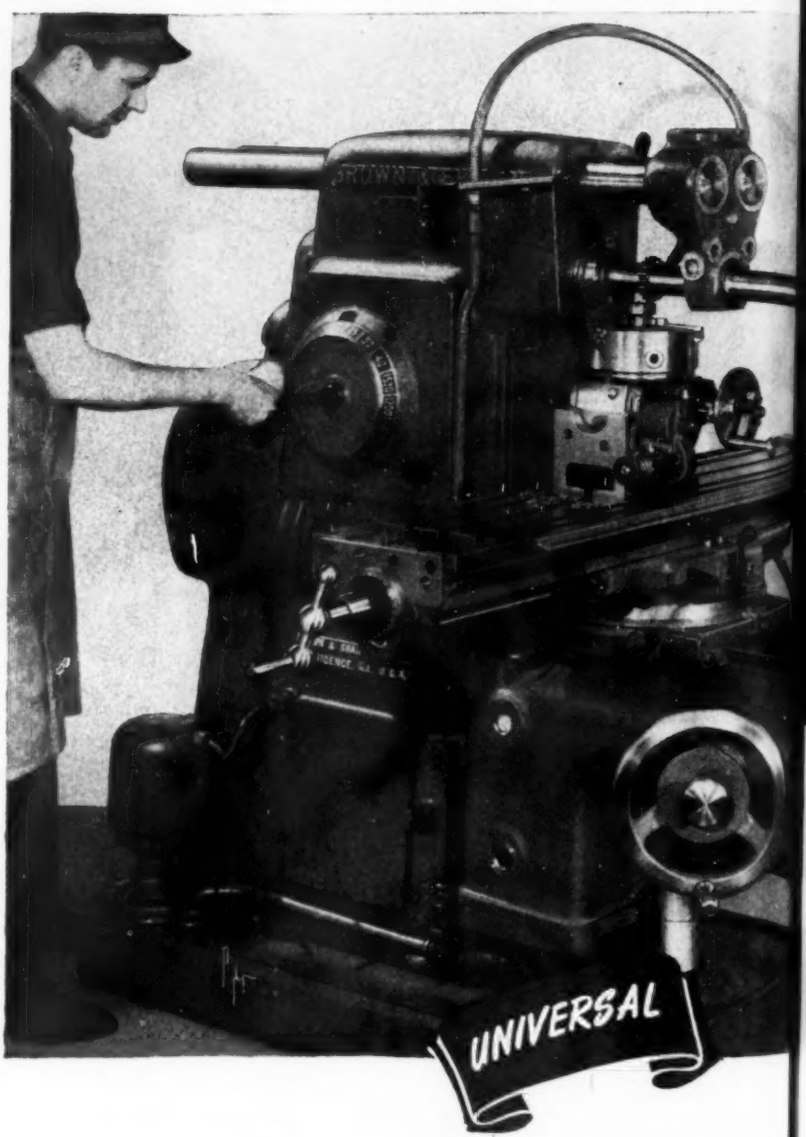
BETTS • BETTS-BRIDGEFORD • NEWTON • COLBURN • HILLES & JONES • MODERN

CONSOLIDATED
MACHINE TOOL CORPORATION

ROCHESTER 10, NEW YORK

In these Light Type Milling Machines --- *All the features for efficient production in toolroom and shop*

BROWN & SHARPE designed these moderate weight, sensitive machines for rapid, easy set-up and handling. Yet they are proportioned to insure more than adequate rigidity and to hold their original accuracy through a long, economical life. They have the "feel" that satisfies every instinct of a good machinist. Such features give the purchaser, over the years, the largest possible return on a sound investment. These and other production advantages . . . needed more today than ever before . . . are fully illustrated and completely described in separate specifications for each of the No. 2 Universal, No. 2 Plain, and No. 2 Vertical Light Type Milling Machines. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.



CONTROLS, naturally positioned . . . fatigue preventing . . . time saving. *Where the operator would naturally expect to find each control, that's exactly where it is on these machines. Controls are grouped for convenient reach and normal hand and arm movements at the front.*

AMPLE RANGES OF SPEEDS AND FEEDS, quickly, easily selected. *Speeds and feeds are each selected by rotating a single lever, one turn in either direction, giving a change in rate. Large, easily read figures on dials indicate rates available. Easy for operator to select most productive rate.*

BROWN &

SET-BACK FACE OF COLUMN provides greater rigidity of cutter support. *Of distinct advantage on the Universal and Plain Machine is the set-back column which permits the cutter to be mounted closer to the spindle nose and allows the use of shorter arbors – a condition essential to maximum cutter rigidity under working loads.*

AUTOMATIC LUBRICATION. *Throughout the column, knee and table, all driving mechanisms and ways have complete automatic lubrication. This saves the operator's time and greatly prolongs the life of the machine.*

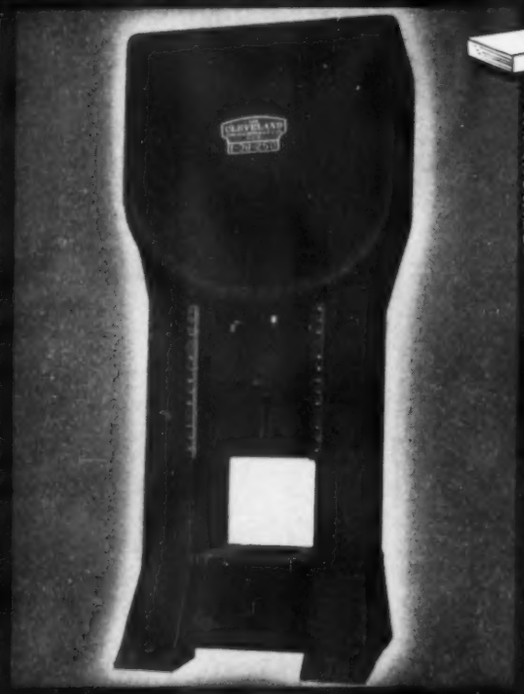
SHARPE

B·S

J. E. S.

Modern CLEVELAND *Presses*

THERE'S A CLEVELAND POWER PRESS FOR EVERY REQUIREMENT



Single Point

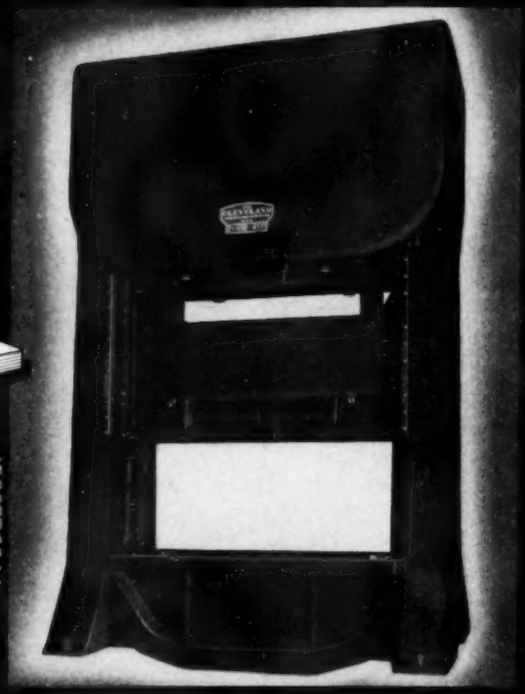
STRAIGHT SIDED

The Press illustrated has a capacity of 250 tons, bed area 42" by 36" and a stroke of 12". However, all Cleveland Modern Presses can be furnished in sizes and capacities to suit particular requirements.

Two Point

STRAIGHT SIDED

Provided with 20" stroke, 6" adjustment, 45" shut height and a bed area of 55" by 108", this Cleveland Two Point exerts a pressure of 450 tons, and this type can be furnished in numerous combinations of stroke, adjustment, bed area, etc.



Four Point

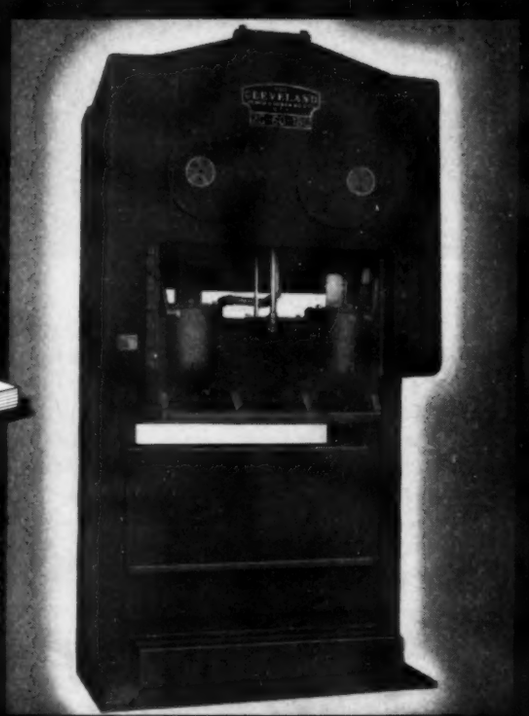
STRAIGHT SIDED

Cleveland Four Point Presses are arranged with a connection at (approx.) each corner of the slide and this feature assures uniform pressure whether the dies are on center or off center. Openings can be provided in the uprights to permit feeding material right and left across the dies.

Two Point

GAP

Except for the design of the frame, which is an overhanging Gap type, this Cleveland Press is similar in construction to the Modern Straight Sided type. The gears, flywheel and drive unit are completely enclosed in the crown and there are no overhanging projections.

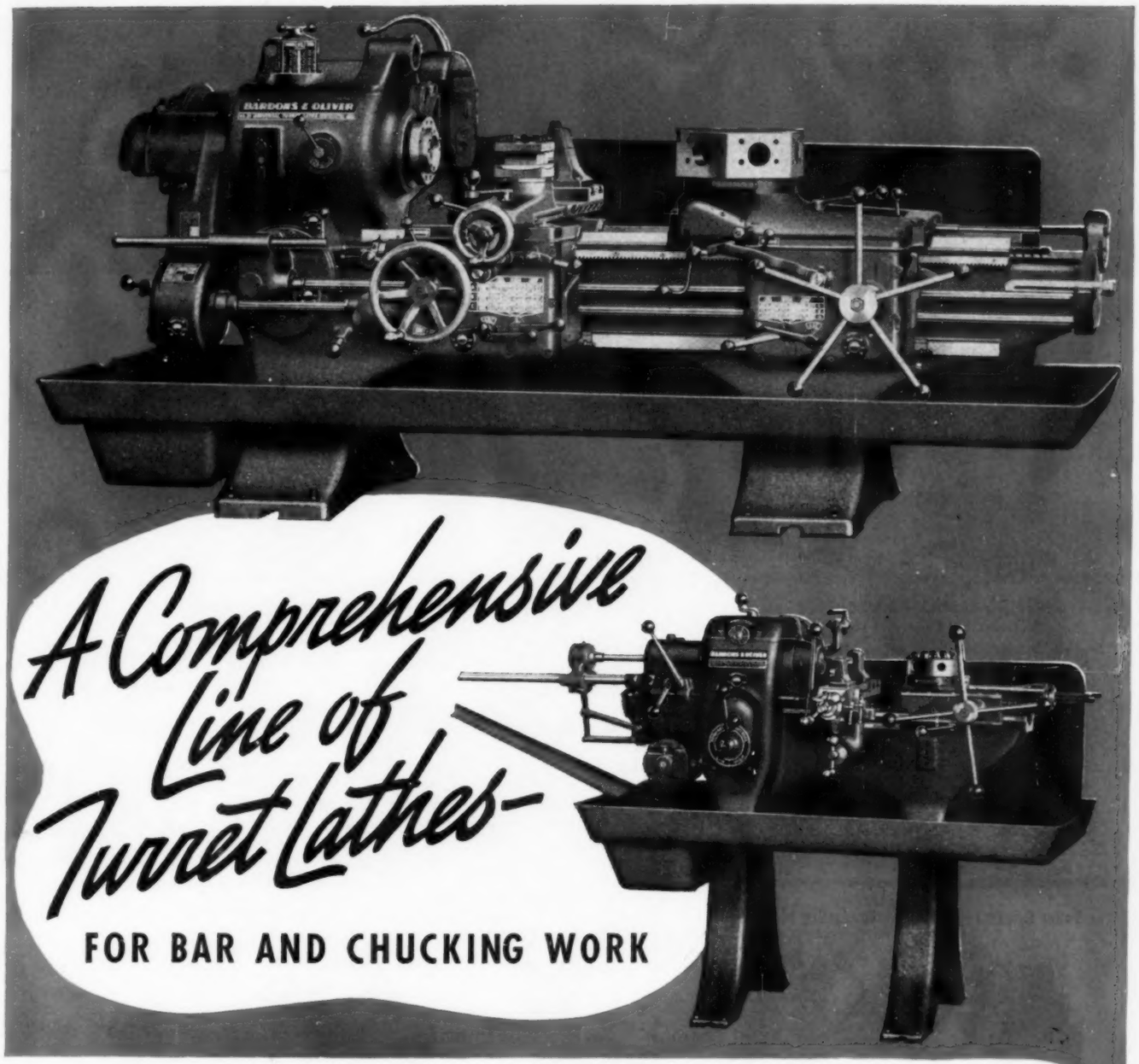


The CLEVELAND

PUNCH & SHEAR WORKS COMPANY

NEW YORK — CHICAGO — DETROIT — PHILADELPHIA — PITTSBURGH

MAIN OFFICE & WORKS: • ST. CLAIR & EAST 40th STREET • CLEVELAND 14, OHIO



The range of the Bardons & Oliver line of turret lathes covers bar work from 1/8 inch diameter or smaller to forgings or castings up to 15 inches. Each size in the line is outstanding in its own field for fast production and high quality work. In this era of keen competition and high wage standards Bardons & Oliver Turret Lathes will lower production cost and raise profit margin.

We suggest you submit your production problems and blue prints of your turret lathe work to our tool engineers for study and recommendation.

BARDONS & OLIVER, INC.
1133 WEST 9TH STREET • CLEVELAND 13, OHIO

GORTON MACHINES —

FOR DIE AND MOLD WORK, PRODUCTION PROFILING, SUPER-SPEED MILLING, ENGRAVING, GRADUATING, CONTOUR GRINDING, PRECISION TURNING OF SMALL SLENDER PARTS, ELECTRIC ARC ETCHING.

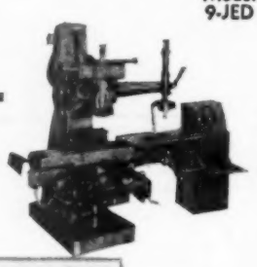
The Complete Line—*Tracer-Controlled* MILLING . . . ENGRAVING . . . DUPLICATING MACHINES & SERVICE

2-Dimensional—**PANTOGRAPH ENGRAVING MACHINES**—*3-Dimensional*

Model 3-Z

Model 3-U

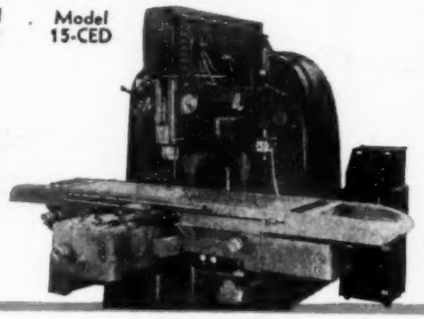
Model 3-L



Electric Control **DUPLICATORS**

Model 9-JED

Model 15-CED

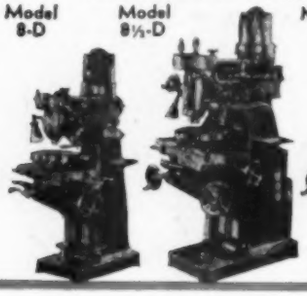


Super Speed **MILLING MACHINES**

Vertical and Universal Head

Model 8-D

Model 8½-D



Model 9-J

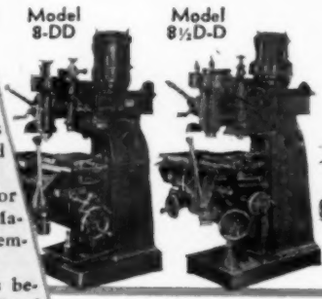
The *Right* MACHINE for MOST JOBS *in Tracer-Controlled* MILLING

- **STANDARD LINE**—10 types of versatile machines, 20 sizes—580 accessories.
- **SPECIAL MACHINES**—Assembled to order from various combinations of Standard Units.
- **ENGINEERING SERVICE**—For Special Tooling...Special Machine Design or "Problem-Solving."
- Request any Bulletins below on Company Letterhead.

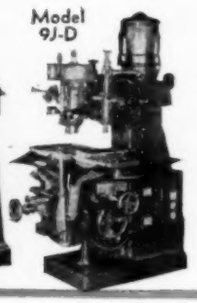
Manual Control **DUPLICATORS**

Model 8-DD

Model 8½D-D



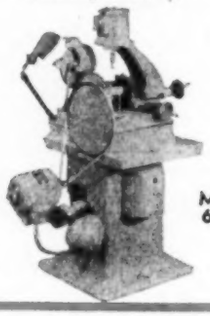
Model 9J-D



Cutter Grinders

Model 375-2 with 717-1 Tool Head

Graduating Machines



Model 687-1

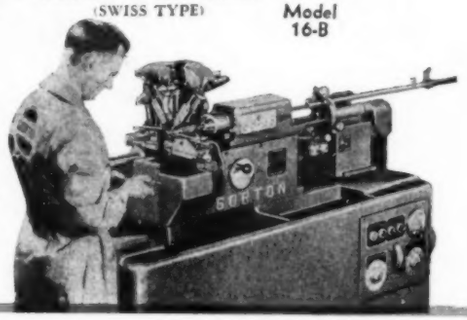
Electric Etching Equipment

Model A-E

Automatic Screw Machines

(SWISS TYPE)

Model 16-B



CHECK SQUARES FOR BULLETINS WANTED; SEND TO US WITH YOUR LETTERHEAD AND TITLE

- ☐ Bulletin No. 1580; Pantograph Engraving Machines.
- ☐ Bulletin No. 1319; Die and Mold Duplicators.
- ☐ Bulletin No. 1400; Super-Speed Vertical Milling Machines.
- ☐ Bulletin No. 1800; Precision Automatic (Swiss-Type) Screw Machines.
- ☐ Bulletin No. 1635; Tracer-Controlled Electric Arc Etchers.
- ☐ Bulletin No. 1317; Accessories and Cutter Grinders.
- ☐ Bulletin No. 1309; Master Copy Type for all Pantograph Machines.
- ☐ Bulletin No. 1833; Handbook for Automatic (Swiss-Type) Screw Machines. Price $2.50.
- ☐ Bulletin No. 1655 is the Condensed Catalog of all Gorton Machines; it will help you decide if Gorton can be of service to you. Includes list of Gorton dealers.

GORTON

GEORGE GORTON MACHINE CO.

Tracer Controlled Milling

1501 RACINE STREET • RACINE, WISCONSIN, U.S.A.

We certainly don't expect you to join our growing list of customers *unless* we can give you better abrasive products for *your particular production jobs* . . . plus better service.

Our rapid growth in ten years from one of the smallest makers of abrasive products to one of the largest, didn't just happen. Company after company found we could help them get better production, lower costs . . . and give them better service. That's how we built our business.

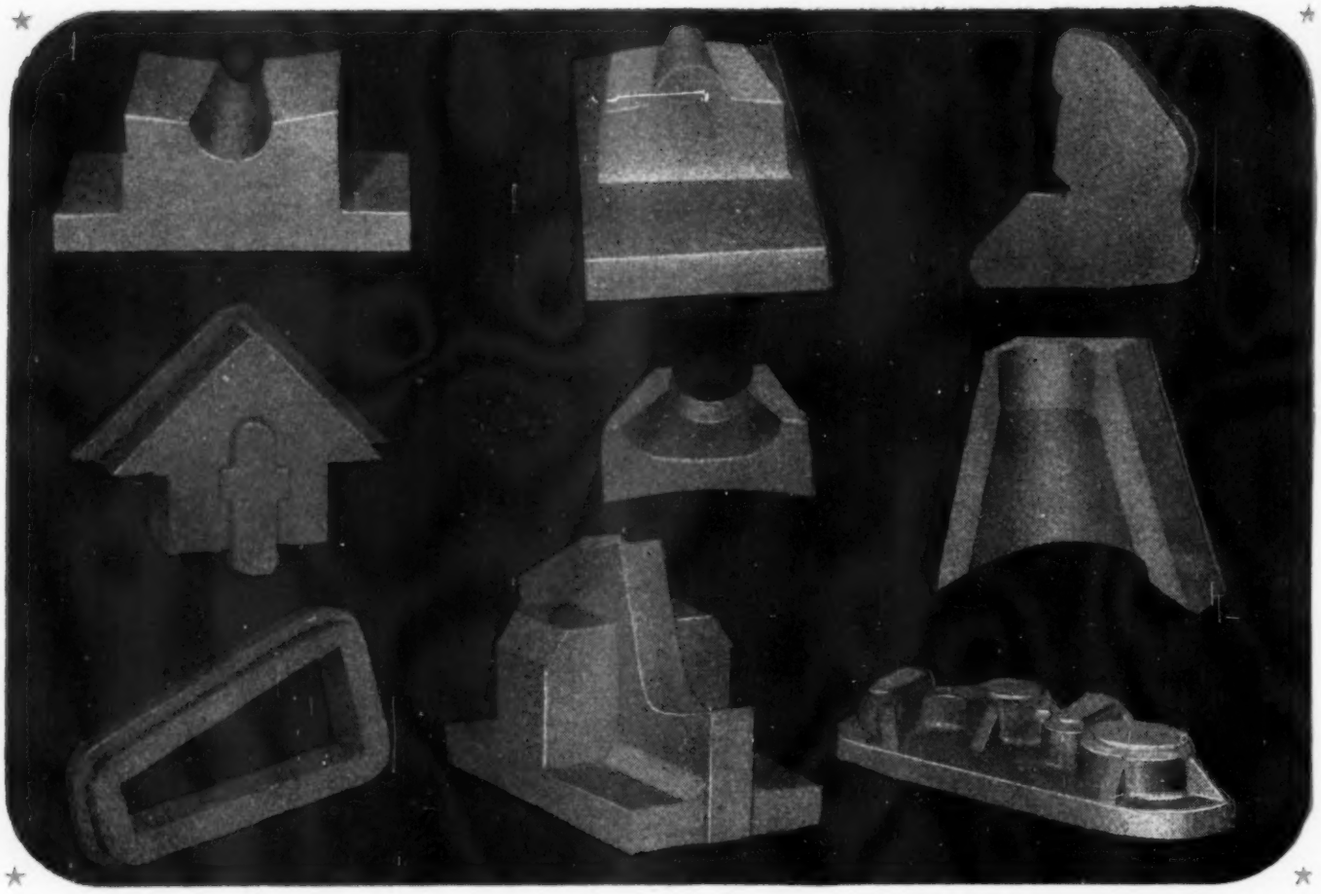
Should you use MID-WEST abrasives? The only way we know for finding out is for you to give us a trial. It's worth it . . . if you're looking for better production, lower costs, and better service. Call us. We'll cooperate.

James Jackson
PRESIDENT

MID-WEST ABRASIVE COMPANY

OWOSSO, MICH. DETROIT ROCHESTER, PA.

GRINDING WHEELS HONING STONES COATED ABRASIVES



In this method OF TOOL AND DIE MAKING YOU BUY LESS STEEL AND REDUCE MACHINING COSTS

Write for New Booklet:

CAST-TO-SHAPE TOOL STEEL

Gives you full details on FCC Air Hardening, Oil Hardening and other Cast-To-Shape Tool Steel Specialties capable of saving you time and money.

Get Your Copy—
Write for it Today

ADDRESS DEPT. AM-60

W & D 566

FCC Cast-To-Shape, the modern method of tool and die making, is effecting important savings of time, trouble and money for an increasing number of manufacturers.

Even very intricate shapes can now be cast successfully within an eighth inch of finished size. This means that you buy less steel at the start and reduce machining costs substantially.

Tools which could not be made by conventional methods except in sections can often be fabricated from FCC Cast-To-Shape blanks in a single piece.

In many instances performance of the tool is better than can be obtained by fabrication from bar stock or forgings.

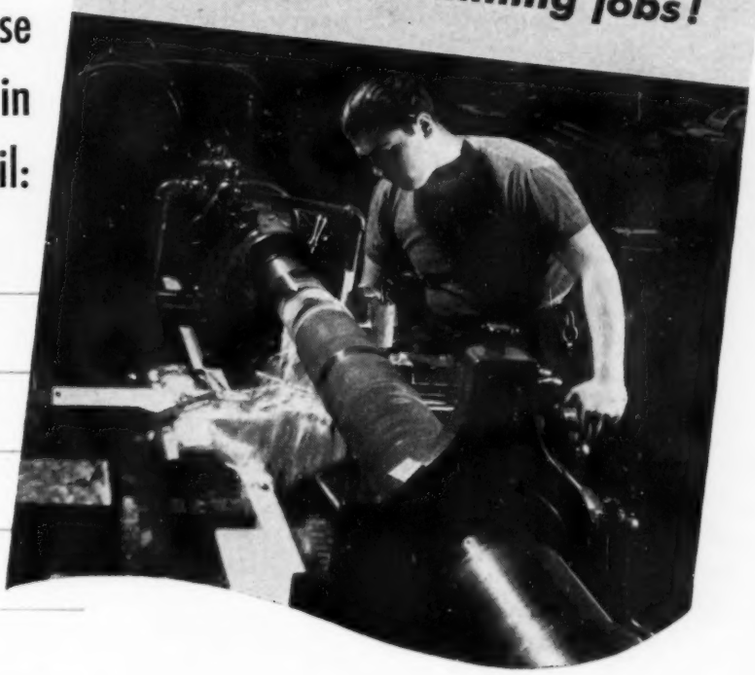
Particulars are available through Allegheny Ludlum representatives; or write for the booklet today.

ALLEGHENY LUDLUM STEEL CORPORATION
Forging and Casting Division
DETROIT 20, MICHIGAN

Announcing the new Gulf Soluble Cutting Oil

A new kind of performance

better for most of your machining jobs!



Get the advantage of all these quality features—found only in the new Gulf Soluble Cutting Oil:

Miscible in all types of water

High lubricating value

Extremely stable

Nonfoaming

Helps prevent rust

Pleasant odor

ANOTHER achievement of Gulf Research Technologists—the new Gulf Soluble Cutting Oil!

The above advantages of this new multi-purpose cutting fluid add up to effective help in improving production, increasing tool life, and reducing down time for tool changes.

Call in a Gulf Lubrication Engineer today and ask him to recommend the proper dilution of Gulf Soluble Cutting Oil for each machining operation in your shop. Or send the coupon below for further information.

Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta
New Orleans · Houston · Louisville · Toledo

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation · Gulf Refining Company
3800 Gulf Building, Pittsburgh 30, Pa. AM

Please send me, without obligation, further information on the new Gulf Soluble Cutting Oil.

Name.....

Company.....

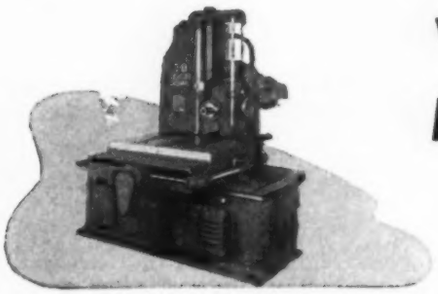
Title.....

Address.....

Retract and Reposition Your Work

within .0002" Selected Location

by Push Button Controls!



3-B DEVLIEG JIGMIL Provides for

Minimum Tool Overhang

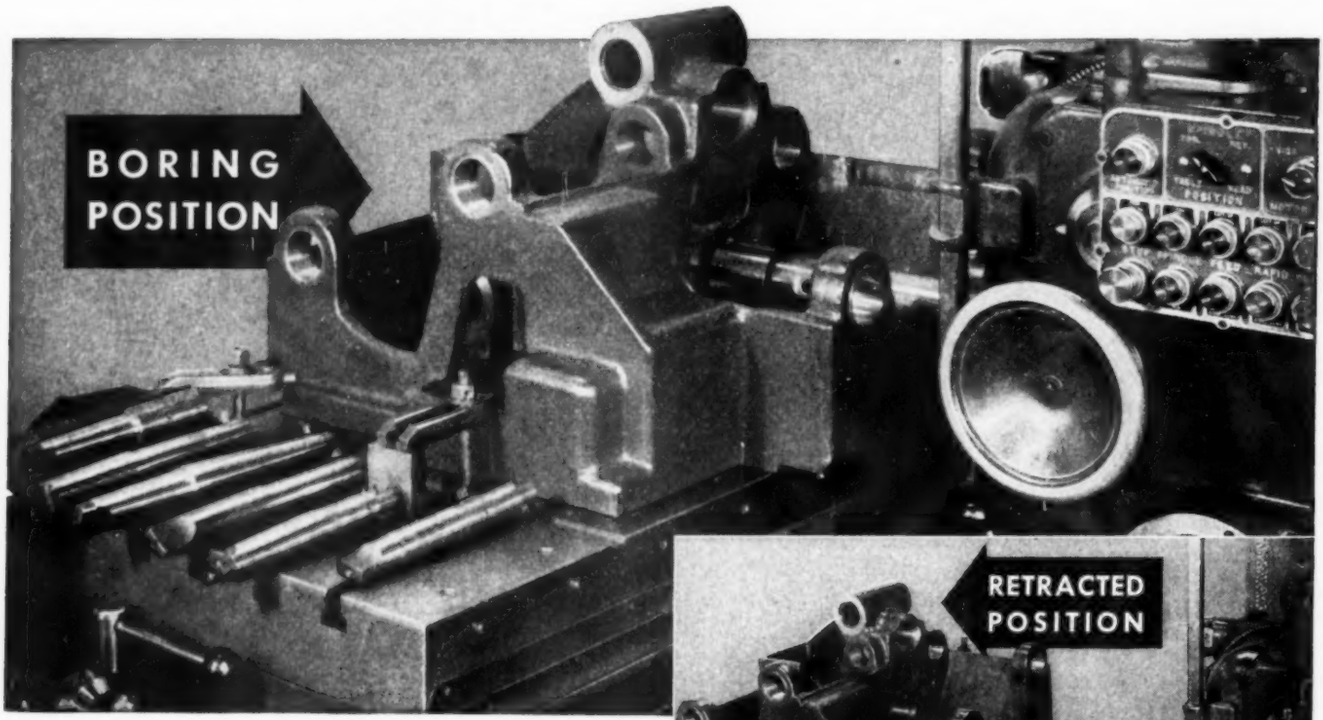
Maximum Operating Efficiency

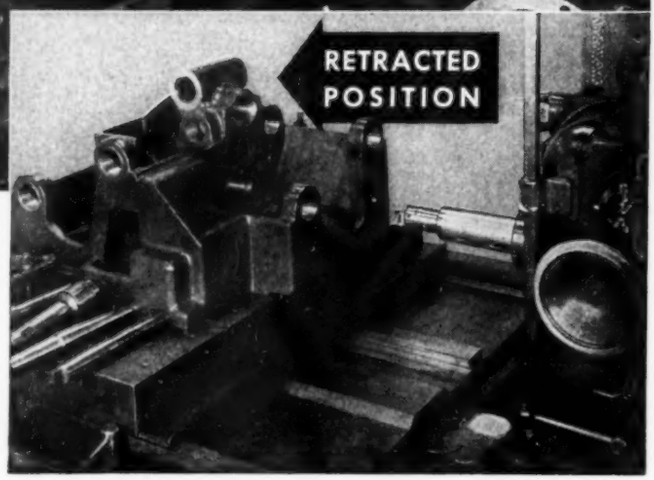
Greater *Controlled* Accuracy

You can save time, cut costs and reach new high standards of accuracy on your difficult precision jig boring and milling operations with a 3-B DeVlieg JIGMIL.

Location of work for minimum tool overhang and top performance advantage! Ready accessibility for necessary tool adjustments and changes! Convenience for checking machined dimensions! All these are served by JIGMIL's centralized push button control means which unlocks and retracts the table to open position, then automatically repositions and locks the table to within .0002" of the selected position.

In addition, JIGMIL's push button controls provide automatic hole spacing accuracy within .0001". Write today for complete descriptive and technical literature.





Here's Precision Boring at its Best!

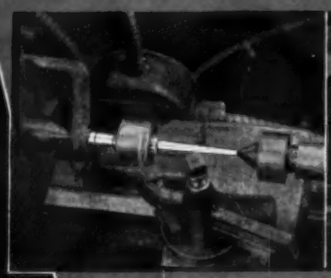
The work piece above is an intricate casting for a three way diamond boring machine. All holes were bored on a 3-B DeVlieg JIGMIL to size, length and spacing accuracies of within .0001". Of the five castings comprising this particular job, the same high JIGMIL standard of accuracy was maintained throughout for perfect interchangeability of parts!

DeVLIEG MACHINE COMPANY DEVLIEG JIGMIL **450 FAIR AVE. FERNDALE 20, (Detroit) MICH.**

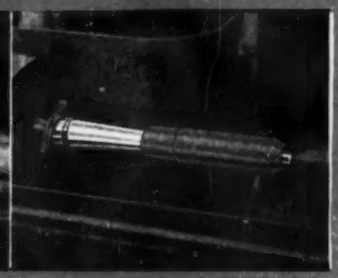
"KNOCK-OUT" EXPANDING MANDRELS

Fast — Positive — Accurate . . . Save machine time, reduce operator fatigue, eliminate special mandrels. Ideal for all turning and grinding operations. Sizes to handle from 3/8" hole to 5 1/2" hole.

Production turning 45° on 11 lb. casting held on M46 Expanding Mandrel.



Turning small piece in tool room. I. D. 15/32" held on MO Expanding Mandrel.



Production grinding 45° angle holding .001" concentricity. Using M3 Expanding Mandrel.

"KNOCK-OUT" CHUCKS

The tougher the job the tighter it grabs the tool. This self activating chuck eliminates slipping . . . marred and bent shanks. Yet it can *always* be loosened by hand. Saves Time —Reduces Tool Costs.

Ask your nearest supplier or mail the coupon today!

K.O.LEE COMPANY

MANUFACTURERS OF MACHINE TOOLS AND AUTOMOTIVE MAINTENANCE EQUIPMENT

ABERDEEN, S. DAK.

K. O. LEE COMPANY
1112 First Ave. S. E., Aberdeen, South Dakota
Please send us illustrated literature on
☐ "Knock-Out" Expanding Mandrels.
☐ "Knock-Out" Keyless, Self Activating, Chucks.

Name_____

Address_____

City_____ State_____

HALLOWELL

Fig. 1334

Fig. 2197

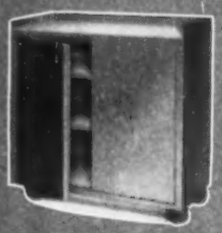


Fig. 1748-B

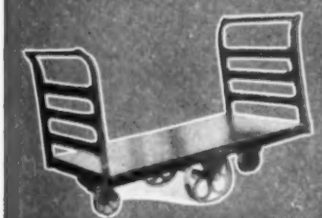


Fig. 769

SHOP EQUIPMENT OF STEEL

"Hallowell" Ready-Made Shop Equipment of Steel is ***designed*** for comfort and utility—***built*** for long service and hard wear.

It comprises:

Stools, chairs, desks, work benches, foreman's desks, tool cabinets and trucks—in convenient sizes with interchangeable parts—all made of the sturdy steel construction that has made "Hallowell" famous. The most exacting needs of shop or factory can easily be filled with "Hallowell" Ready-Made Shop Equipment of Steel. Write for our "Hallowell" Catalog and keep it handy for ordering your equipment.

"Unbrako" and "Hallowell" products are sold entirely through distributors.

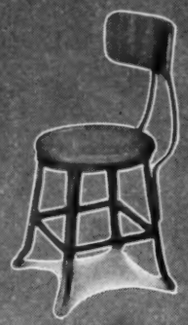


Fig. 1249

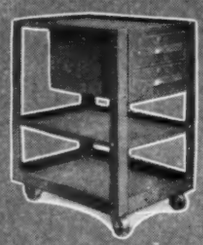


Fig. 1855-A

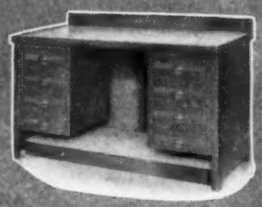


Fig. 1731

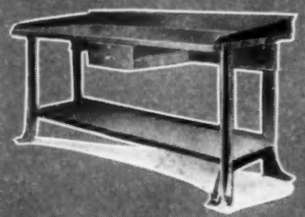


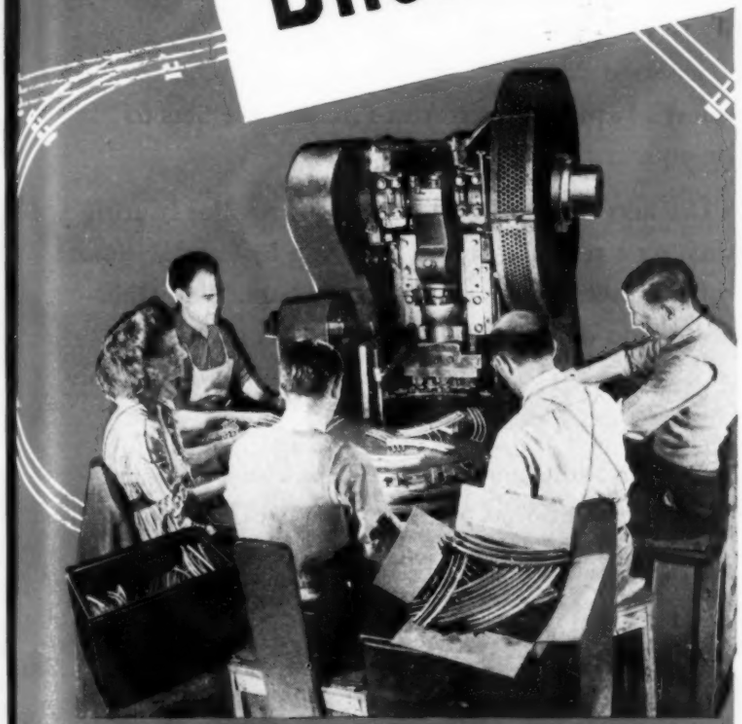
Fig. 732
Pat. & Pat's Pend.
Drawer is extra

OVER 43 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA., BOX 4 • BRANCHES: BOSTON • CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • SAN FRANCISCO

Bliss' Stamping Grounds



RAILS AND TIES for Lionel electric toy trains are assembled at the rate of 1250 per hour in this Bliss No. 21 Inclinable Press with 48", 8-Station Bliss dial feed and a staking die.

MINIATURE PRESSED METAL VERSIONS of the "real thing" are the toy manufacturers' contribution to a youngster's world of make-believe. Authentic streamlined electric trains that puff smoke, futuristic autos and planes, miniature typewriters, refrigerators, jeeps, tractors...all are "musts" in playing grown-up.

As you'd expect, Bliss leads the stamping press parade in this ever-changing march-of-the-toys, for Bliss makes every type and size of press—mechanical and hydraulic—necessary to blank, draw, form and assemble an endless variety of playthings, as well as their counter-parts in real life. While one Bliss press is busy forming the entire turret top of *your* new car, another is stamping its toy copy for the kids. A massive 2500 ton press blanks two boxcar chassis frames at a stroke, while smaller machines complete whole miniature "railroads" for the "living room express."

Toyland is but another of "Bliss' Stamping Grounds." Here, too, as in so many mass-production industries, Bliss equipment contributes mightily to profitable low-cost manufacture. In some way Bliss press-building experience—90 years of it—can help in solving your production problem. Try putting it up to Bliss.

E. W. BLISS COMPANY, DETROIT 2, MICH.

WORKS AT: Brooklyn, N. Y.; Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Derby, England; St. Ouen sur Seine, France • SALES OFFICES: Detroit; Brooklyn; Cleveland, Dayton, Toledo, Ohio; Lansing, Mich.; Chicago; Philadelphia; Rochester; New Haven; Boston; Toronto.

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY

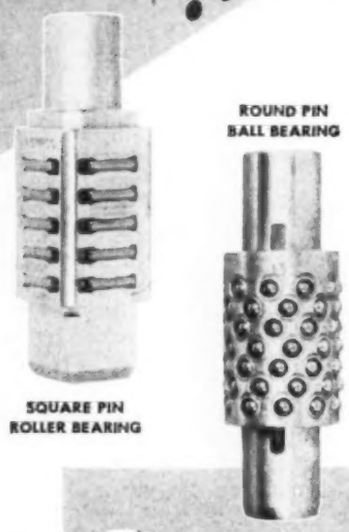
STAY AHEAD WITH *Bliss*

For Mechanical and Hydraulic Presses
Rolling Mills
Can and Container Machinery

1947

It's New... Free-Operating ...Accurate!

IT'S A LEMPCO PRECISION ANTI-FRICTION DIE SET



FOR increased die life . . . faster production . . . greater economy . . . put Lempco Anti-Friction Die Sets to work for you.

Lempco Die Sets are equipped with ball or roller bearing guide pins. As a result, dies can be set up by hand without the use of hammers, mauls, jacks or pry bars. This eliminates production delays caused by accidents to dies and punches . . . saves up to 60% in matching up and assembly time . . . means extra profit for you.

Lempco Anti-Friction Die Sets have been run over long periods on a conventional press as well as on special high speed presses. To assure positive accuracy, bearings have pre-load of .0015". All surfaces including extremely long bosses are ground to exceptionally close tolerance.

Place your order today and make sure you cash in on all the money-saving features offered by Lempco Precision Anti-Friction Die Sets.

LEMPCO

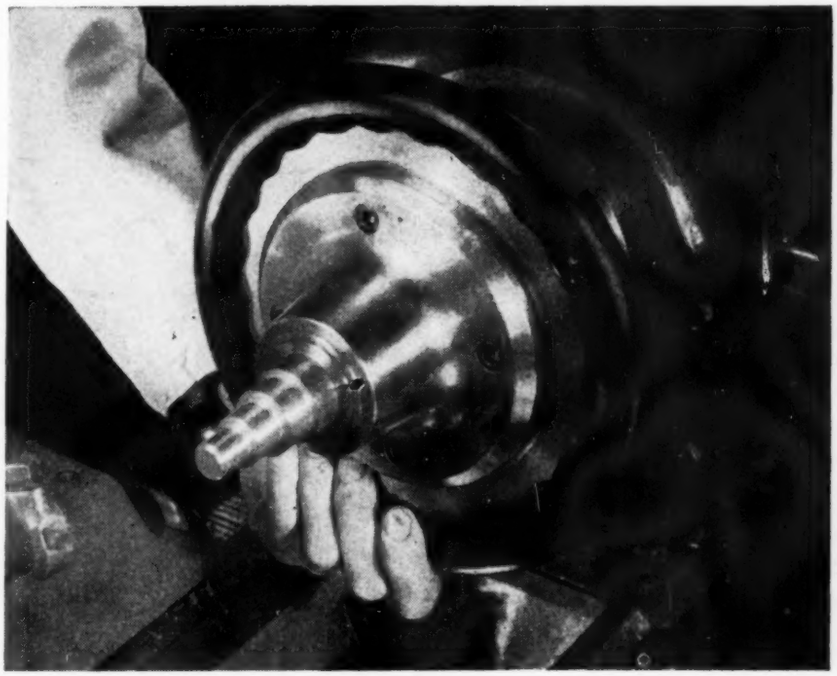
5711 DUNHAM ROAD
BEDFORD, OHIO, U.S.A.

● *Write for "Facts About Lempco Precision Anti-Friction Die Sets." It's a fully illustrated catalog which lists all the advantages Lempco Die Sets have for you.*

HARDINGE
ELMIRA, N.Y.

The Right Combination for Increased Production

Hardinge-Sjogren Speed Collet Chucks and Hardinge Precision Collets

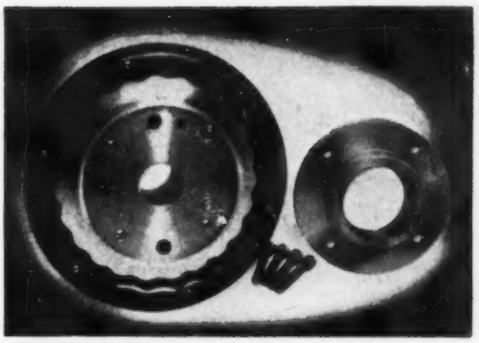


Hardinge-Sjogren Speed Collet Chucks and Hardinge Precision Collets together mean increased production.

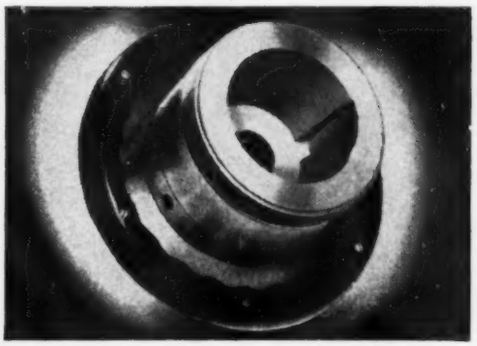
Hardinge-Sjogren Speed Collet Chucks give greater collet capacity and speed production. Available in three sizes, 1″, 1⅜″ and 1¾″ collet capacity, and readily adapted for use on threaded nose, tapered-key drive, or cam lock spindles. An almost effortless turn of the wheel opens and closes the collet to release or grip the work as desired.

Hardinge Precision Collets symbolize accuracy, durability, and low price. They are made of special steel, uniformly heat treated, with hardened surfaces and spring temper for proper operation.

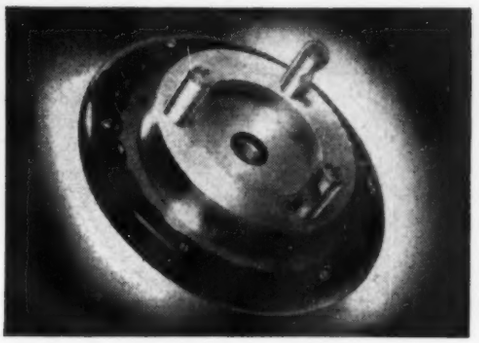
With such sure and easily adjustable holding of work, time is saved, accuracy increased and results are better. For full value from your tool room lathes, engine lathes and milling machines, equip with Hardinge-Sjogren Speed Collet Chucks and Hardinge Precision Collets.



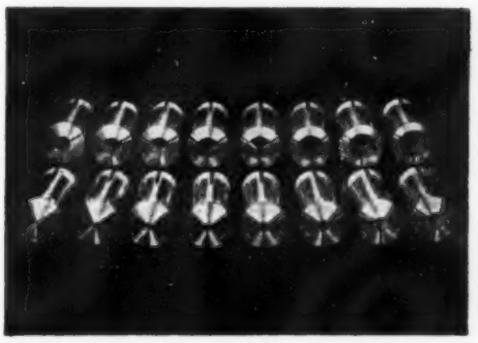
Hardinge-Sjogren Plain Back Chuck with Adapter plate for Machines with Threaded Spindle Nose.



Hardinge-Sjogren Chuck for Lathes with Tapered Key-Drive Spindle Nose.



Hardinge-Sjogren Chuck to fit directly on Lathes with Cam-Lock Spindle Nose.



Hardinge Precision Collets are available in a wide range of sizes; carried in stock in Elmira and other industrial centers.

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

CUSTOM-BUILT TO THE MOST *Exacting Specifications*

G·S SMALL GEARS are cut to extremely close tolerances. Each specification, however exacting, is executed and inspected with a degree of precision seldom equalled in small gear manufacture. Here, every facility has been provided for speedy, uniform quantity production: 1. Skilled engineers and designers; 2. Modern methods and machinery; 3. Trained operators; 4. Intensive series of inspections; 5. All operations under the constant supervision of *specialists*—men long experienced in producing Fractional Horsepower Gears exclusively. That's why G. S. Gears perform so smoothly and dependably for years, and that's why *each* G. S. Gear measures up to the same, exacting specifications. If Small Gears, from 12 to 96 d.p., are an important consideration in YOUR plans, for your own best interests, let our organization of specialists tackle the job! Consult with our engineers, or write today for a copy of the new G. S. catalog bulletin.

SEND FOR OUR 4-PAGE CATALOG

GEAR Specialties

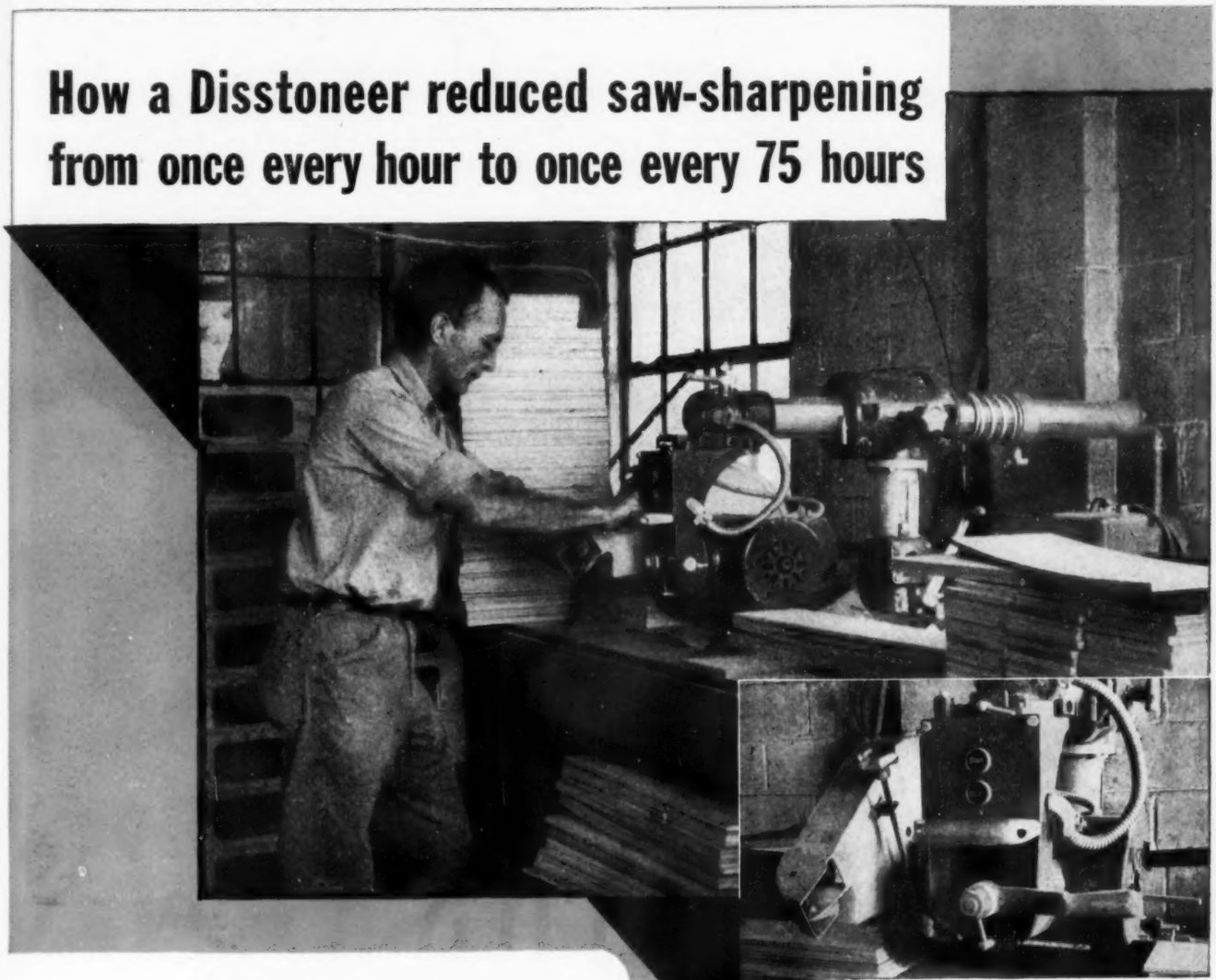
Spurs • Spirals • Helicals • Bevels • Internals • Worm Gearing • Racks • Thread Grinding

2635 WEST MEDILL AVENUE • CHICAGO 47, ILLINOIS

MEMBER OF AGMA

WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS

How a Disstoneer reduced saw-sharpening from once every hour to once every 75 hours



It was in the plant of Allwoods, Inc., Toledo, Ohio, where plywood of various kinds and thicknesses is cut in shapes for radio cabinets, toys and other products. The company had been using a combination circular saw which required resharpening every 1 to 1½ hours, with a down time of 5 to 10 minutes. Even after resharpening, the saw would cut rough after the first few cuts and considerable sanding was necessary.

The Disstoneer* who studied the problem recommended a Disston Inserted-section Carboloy-fitted Saw with alternate beveled teeth. After 75 hours of use, without resharpening, the Carboloy-fitted saw cut as smoothly and easily as when first placed on the machine. Cutting was faster, sanding costs reduced, results more uniform and production increased.

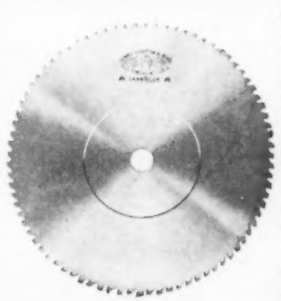
One company executive stated that in all his experience with cutting tools, this saw was the only tool he ever bought that out-performed the manufacturer's claims and surpassed his own most optimistic expectations.

STEEL . . . Everybody who wants to obtain steel, can help himself to get it by immediately starting scrap into the channels that serve steel mills.

*DISSTONEER—a man who combines the experience of Disston leadership and sound engineering knowledge, to find the *right tool* for you—to cut wood, to cut metal and other materials—and TO CUT YOUR COST OF PRODUCTION—*not only on special work, but on ordinary jobs as well.*

DISSTON INSERTED SECTION CARBOLOY FITTED SAW

Used in many manufacturing plants for sawing plywood, asbestos pipe covering, aluminum, cardboard, laminated phenol resinoid products, many others. Teeth are held firmly in place, eliminating up and down or lateral movement. Large open gullets allow free discharge of sawdust, reducing friction and permitting faster feed.



HENRY DISSTON & SONS, INC., 120 Tacony, Philadelphia 35, Pa., U.S.A.

SPECIALISTS IN THE PRODUCTION OF GEARS

for individual needs

SPUR GEARS
•
HELICAL GEARS
•
BEVEL GEARS
•
MITRE GEARS
•
INTERNAL GEARS
•
WORMS
•
WORM GEARS

SPROCKETS
•
RATCHETS
•
SPLINED SHAFTS
•
RACKS
•
SEGMENT GEARS
•
LEAD and FEED SCREWS

This organization, with 63 years of manufacturing experience, is equipped to do practically any kind of gear job. Our service assures you of Gears that possess close limits of accuracy.

Our engineering service is available for consultation.

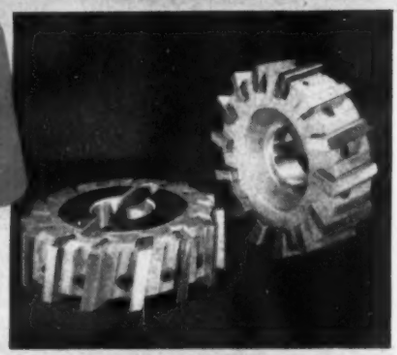
The ADAMS COMPANY
DUBUQUE, IOWA
ESTABLISHED 1883

USE INGERSOLL INSERTED BLADE CUTTERS

FACE MILLS • HALF SIDE MILLS • STAGGERED TOOTH SLOTTING • BORING HEADS • HELICAL • END MILLS

REDUCE TOOL COSTS

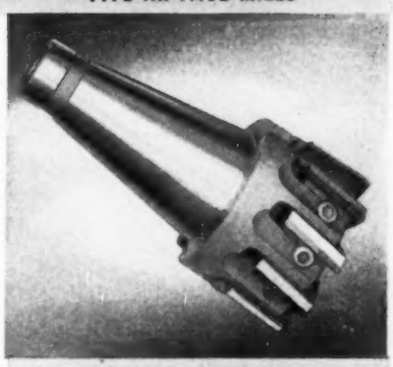
REPLACE SOLID TYPE MILLING CUTTERS



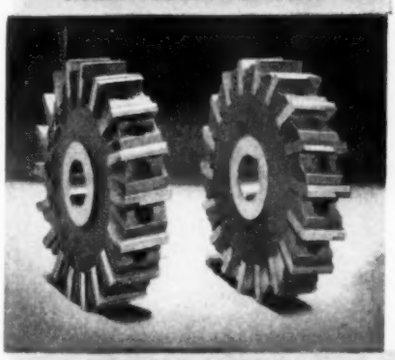
TYPE NX FACE MILLS

SHEAR CLEAR FACE MILLS

Ingersoll *inserted* blade cutters are replacing solid high speed steel and solid brazed tip designs due to economy of replacement blades. When worn out it is not necessary to purchase complete new cutters, as only the *inserted* blades are perishable. The cost of a new solid cutter is many times the small cost of a set of Ingersoll *inserted* blades.



END MILLING CUTTERS



HALF SIDE MILLS

When buying cutters always check replacement blade costs. The housing is a capital investment which lasts for many years. The blades are perishable and a continuous expense. Due to simple, though rigid, blade lock, Ingersoll *inserted* blades are less expensive. — High Speed Steel, Cast Alloy, and Carbide tipped.

INTERLOCKING SLOTTING CUTTERS

CONE TYPE FACE MILLS

This booklet shows through illustrations and charts the wide range of usefulness of the Ingersoll Cutter Grinder.

This 15" x 23" grinding chart gives basic grinds for standard milling cutters. Suitable for mounting in a conspicuous place in tool room.

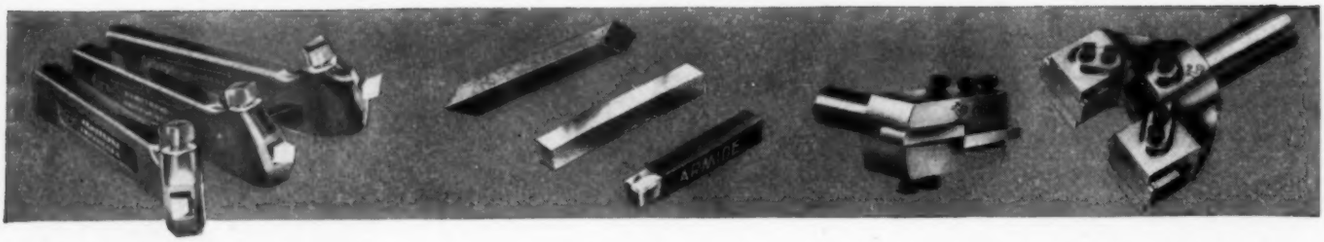
This booklet is intended to help you properly select standard cutters for your work. Where these do not apply we are prepared to design and build special tools.

Write for Your Copy of these Ingersoll Bulletins

THE INGERSOLL MILLING MACHINE CO., ROCKFORD, ILL., U. S. A.

ARMSTRONG

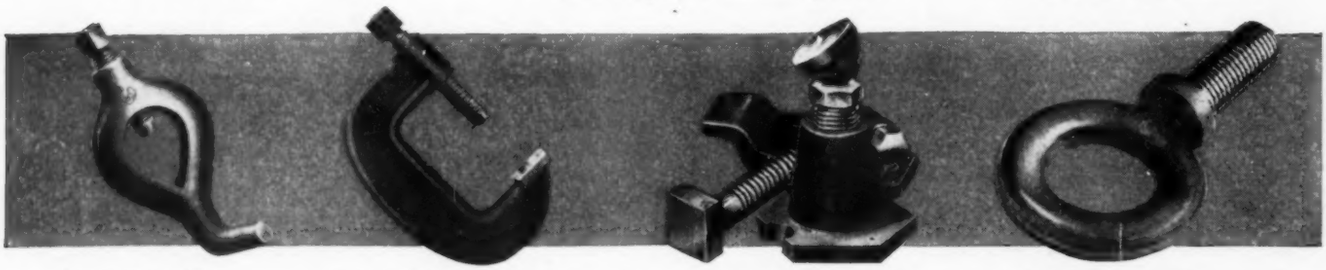
Quality TOOLS



ARMSTRONG TOOL HOLDERS
Permanent, multi-purpose tools, for every operation on Lathes, Planers, Slotters and Shapers.

ARMSTRONG HIGH SPEED
Ready-to-grind Bits...Ground Cutters.
ARMALOY Cast Alloy CUTTER-BITS
ARMIDE Carbide-Tipped CUTTERS
6 cutter shapes, 12 sizes—2 grades.

ARMSTRONG Turret Lathe and Screw Machine TOOL HOLDERS
Drill Holders, Cutter Holders, Finishing and Knurling Tools for standard operations.

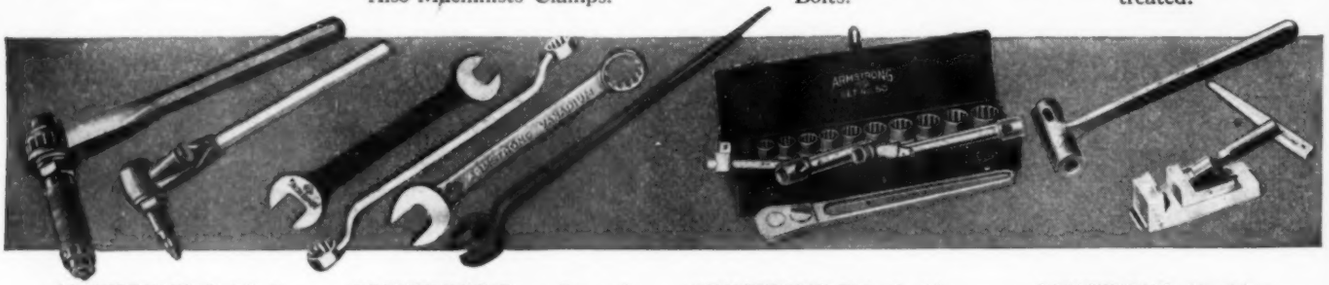


ARMSTRONG Drop Forged DOGS
Lathe Dogs, Milling Machine Dogs, and Clamp Dogs. 12 types, all sizes.

ARMSTRONG Drop Forged "C" CLAMPS
Heavy Duty, Medium Service, Deep Throat, and Tool Makers' types in all sizes. Also Machinists' Clamps.

ARMSTRONG Setting Up Tools
A complete line of Drop Forged Strap Clamps, Planer and Bracing Jacks and T-slot Bolts.

ARMSTRONG Drop Forged Eye Bolts
Plain or shoulder pattern. Blank or Threaded. 14 sizes, Drop Forged and heat treated.

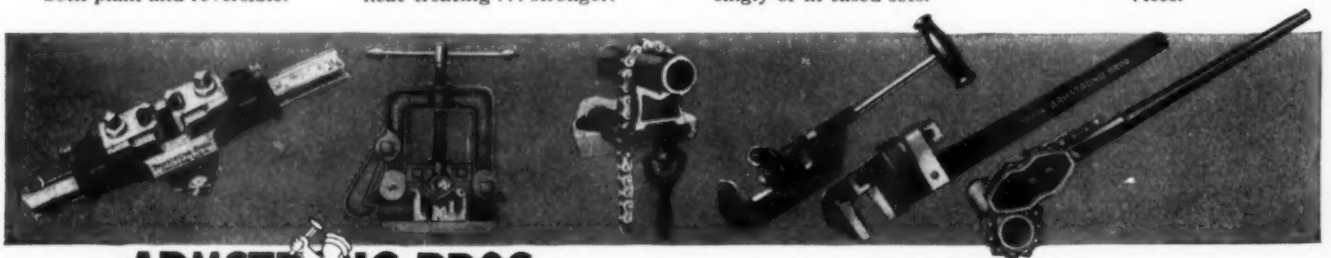


ARMSTRONG Ratchet Drills
All steel wearing parts hardened. Packer, Railroad, Standard, and Short types, both plain and reversible.

ARMSTRONG Drop Forged Wrenches
Both Carbon and Alloy Steel. Over 100 types in all sizes. Improved designs, steels, and heat treating ... stronger.

ARMSTRONG Detachable Socket Wrenches
All sizes and types with driving handles, extensions, and drop forged ratchets. Sold singly or in cased sets.

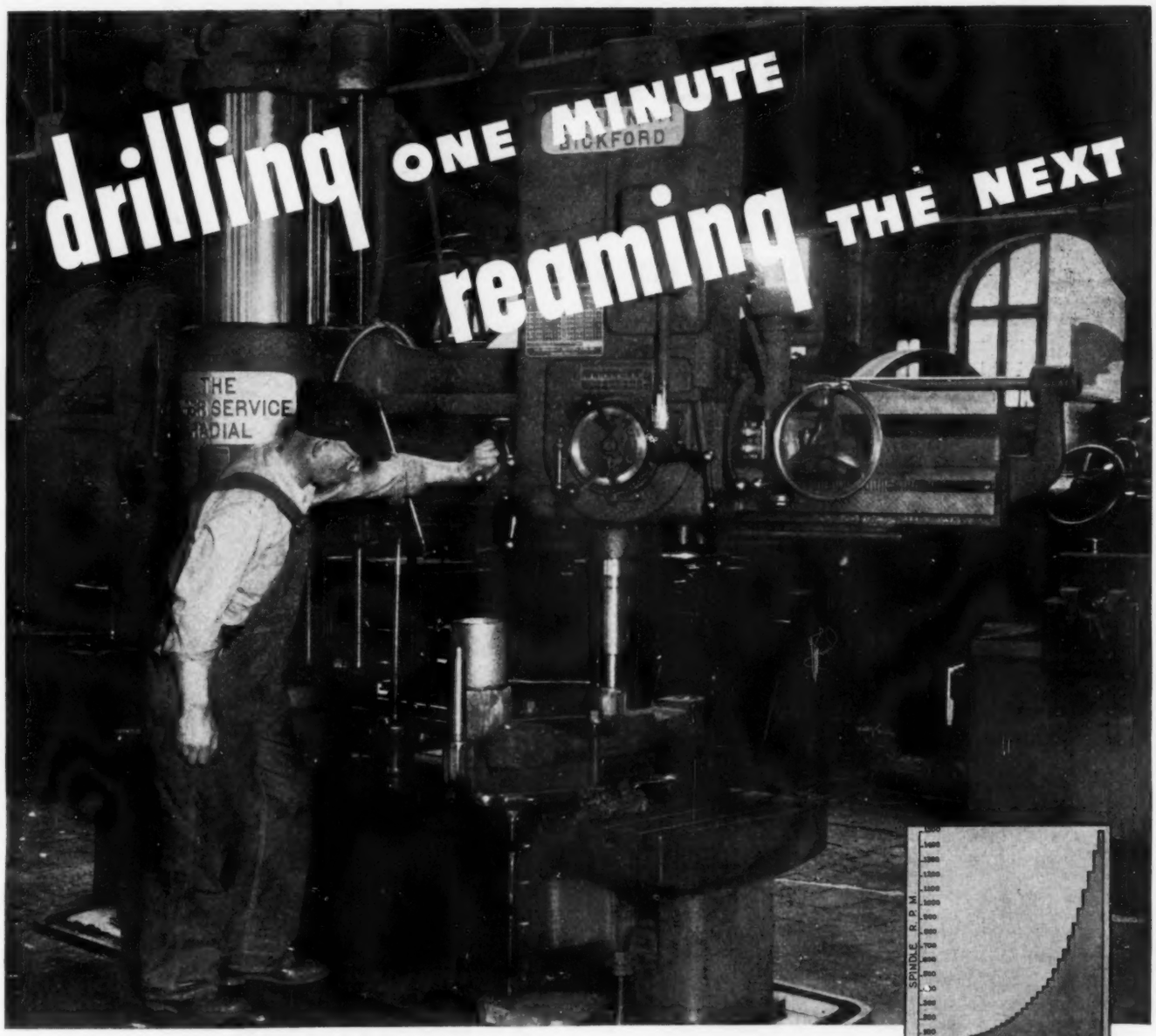
ARMSTRONG Machine Shop Specialties
Drill Drifts, Tool Posts, Drill Holders, Cutter Grinding Holders, and Tool Makers' Vices.

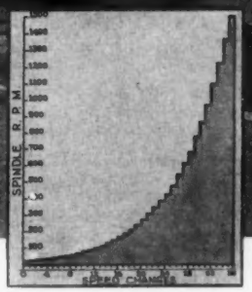


ARMSTRONG BROS.

Better Pipe Tools. A complete line, each a better tool with hardened, alloy or drop forged parts wherever they will add to strength or tool life.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
N. FRANCISCO AVE. CHICAGO 12. U. S. A.
Eastern Whse. and Sales: 199 Lafayette St., New York 12, N. Y.
Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco 3, Calif.





36 speeds—no gaps or duplication—with only 17 gears.

FEED IN THOUSANDTHS AND THREADS PER INCH
DOTTED LINE INDICATES NEUTRAL AND HAND FEED POSITION

POSITION OF FEED CHANGE LEVER									BACK GEAR LEVER
1	2	3	4	5	6	7	8	9	
25	21	17	14	12	10	8½	7	6	
.125 F 8 T	103	.087 F 11½ T	.71 F 14 T	59	50	42	35	29	

- *18 rates of power feeds from .006" to .125" per revolution include standard tap leads.*

On maintenance work in railroad shops Cincinnati Bickford Super Service Radials keep the iron horses fit. Boring, tapping, drilling, facing or reaming, their speed and ease of handling keep repair costs down —they have the power, and the correct speeds and feeds for every job.

Write for detailed Bulletin R-24A.

See our condensed catalog in Sweet's File.

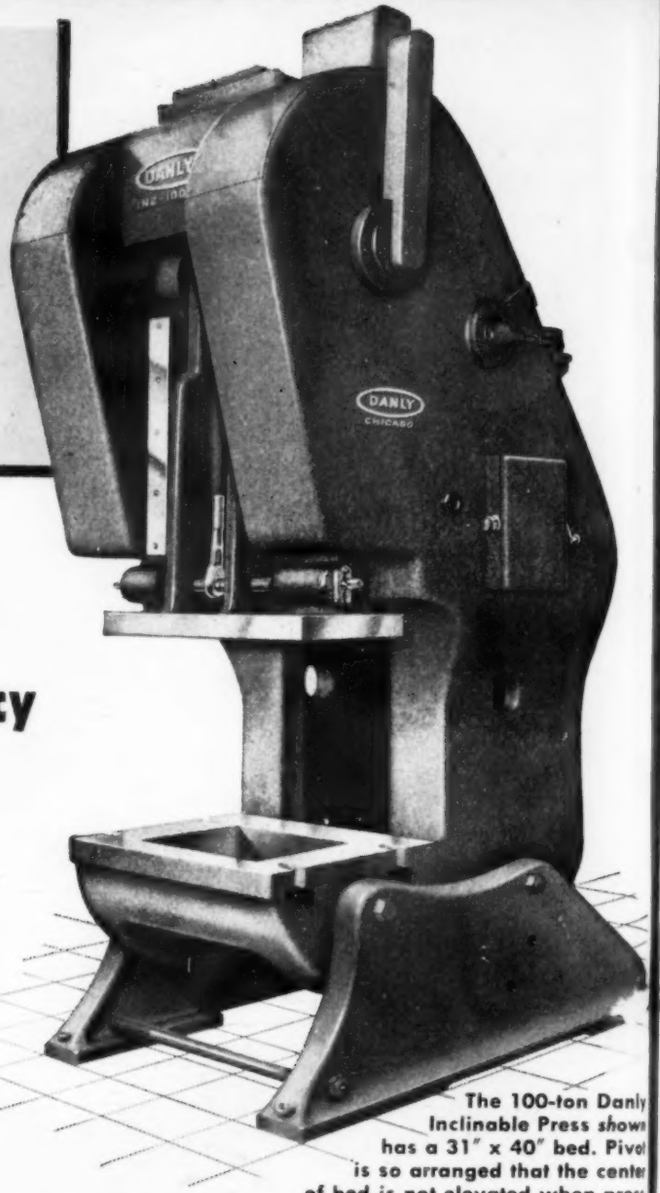
RADIAL AND UPRIGHT SUPER C.B SERVICE DRILLING MACHINES

Equal Efficiency of Every Unit Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

DANLY

Open Back Inclinable and .... Horning Presses

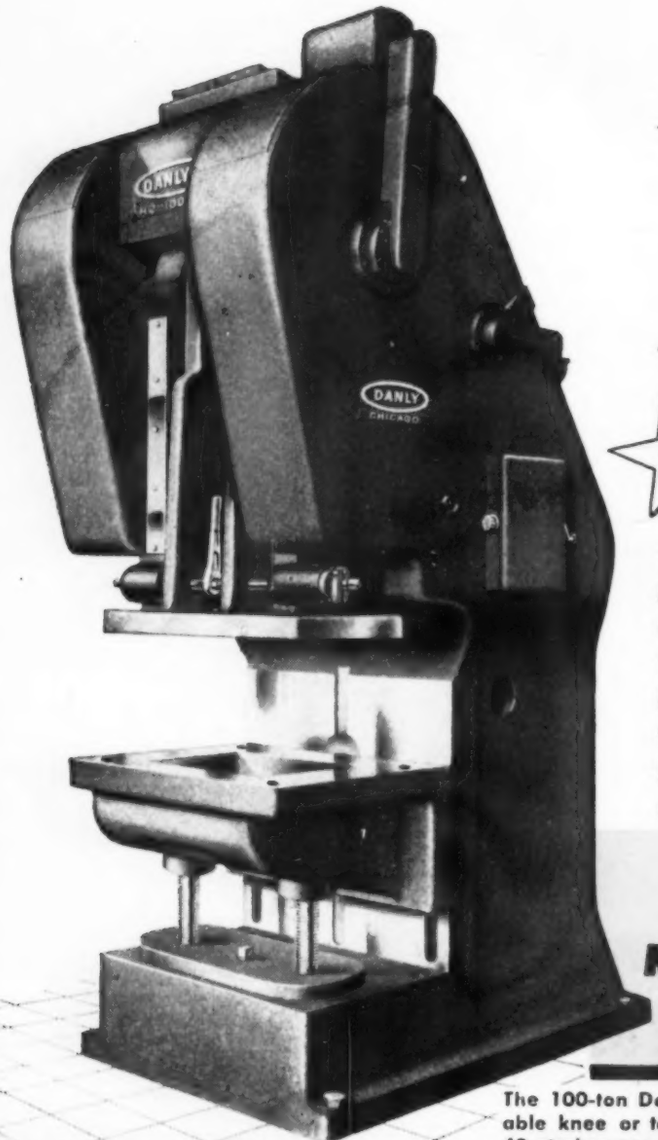


The 100-ton Danly Inclinable Press shown has a 31" x 40" bed. Pivot is so arranged that the center of bed is not elevated when press in inclined.

1 Rugged Construction

2 Mechanical Accuracy

3 Pressure Lubrication



The 100-ton Danly Horning Press is shown with removable knee or table. Press has an 8" stroke—operates at 40 strokes per minute. Adjustment of slide 4" by hand.

4 Air-Friction Clutch

5 Modern Design Features

★ Steel Unit Frames—rugged one-piece all-steel construction . . . ★ Enclosed Eccentric Gear Drive . . . 2-Point Suspension . . . ★ Pressure Lubrication of all gears and internal moving parts . . . ★ Solenoid Controlled Air-Friction Clutch . . . ★ Air Counter Balance Cylinder for slide return, and many similar features of modern design.

DANLY

MACHINE SPECIALTIES, INC.

2100 SOUTH 52nd AVENUE • CHICAGO 50, ILLINOIS

American Machinist's Spot NEWS OF METALWORKING

WAA is making up a second list of surplus machine tools to be sold at "25%-off-market" prices. Prices will be same as for those machines offered since Oct. 28. Eventually all surplus machines except those in short supply will be put on the market at so-called fixed prices.

Two automobile manufacturers are considering selling lots used by employees for parking for fear that they may have to pay time from the moment men drive into them. The great inconvenience of an employee having to find parking space on the street or elsewhere, perhaps a half mile or more away from the plant, is a potent bargaining weapon in the hands of management.

Manchuria has been so stripped of metalworking equipment that it will be able to supply only coal, pig iron and a few other industrial raw materials the next few years, states official U. S. observer.

British shipped abroad $32 millions of machine tools during 1946, or more than double any previous year except 1944. France was biggest customer, taking nearly 30% of total in first nine months. British India and South Africa were second and third largest buyers.

Showdown looms between natural and synthetic rubber. If natural rubber becomes available, chance is it soon will replace synthetic in automobile tires. GR-S, best general-purpose synthetic, is equal to natural in such products as hard rubbers, wiring insulation, vacuum-packed closures, fabric coatings.

> A new industry is developing in direct-thrust aircraft engines—jets, rockets and gas turbine-propeller plants. It probably will include gas turbines for industrial, automotive and maritime use. Jet engine output in October was almost 100 units, against 221 reciprocating engines. General Electric, Westinghouse and other non-aircraft companies are expected to retain lead in new field.

Shipbreaking yards are working at capacity producing needed scrap. They have more hulls than they can process. Maritime Commission withdrew 96 ships from service during month ended Dec. 15, but added 121. Commission now has 1742 ships in its reserve fleet moored at nine sites.

Sixty-seven General Motors technicians arrived in Australia Dec. 28 to help get two GM plants into production as soon as possible. Detailed production planning cannot be done, however, until Australian government decides whether imported car parts not now made in the Commonwealth will be given preferential tariff treatment. Government is proposing to cancel the preference.

Surplus government-owned cutting tools valued at $58 millions have been switched from an agency sales basis to a competitive bid basis. Most of the stock is in WAA warehouses at Detroit, Cleveland, Cincinnati, Chicago, New York, Philadelphia and Boston. Tools are of 26,000 different sizes.

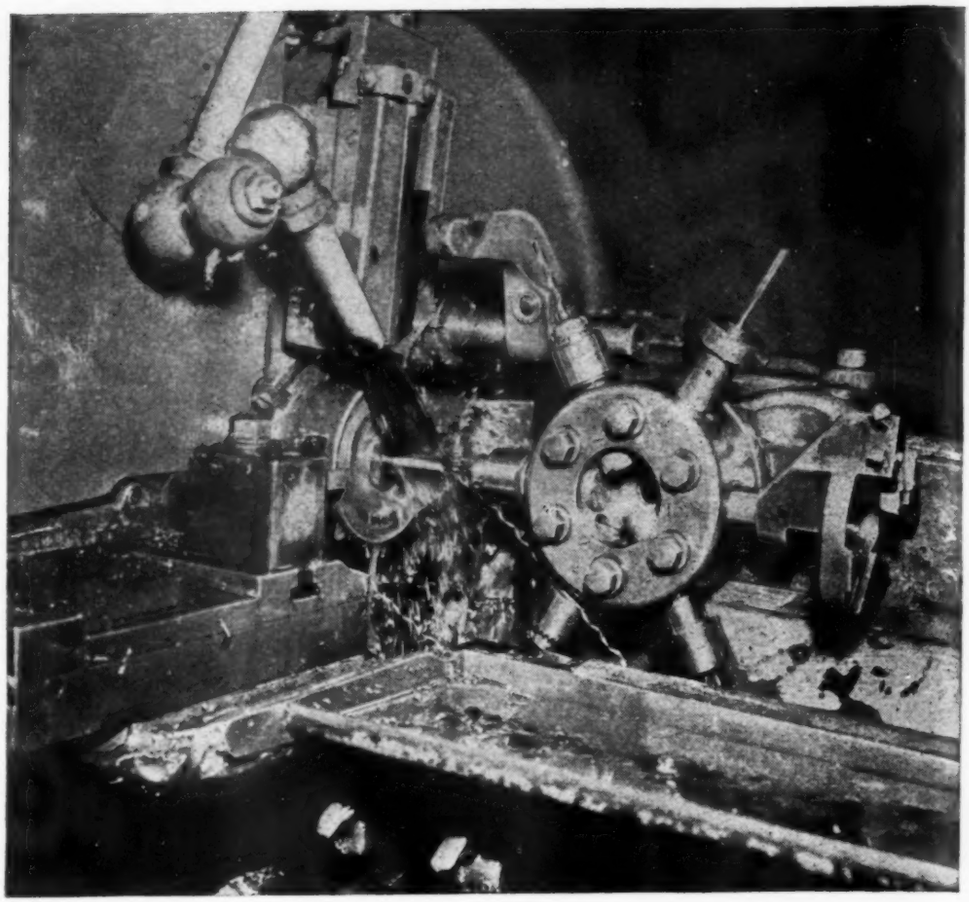
No more plants, mines or other productive facilities can be seized by the government, now that President Truman has officially proclaimed the war's end. The proclamation swept away the last emergency powers of the government to deal with labor disputes.

Locomotive factory to produce 120 locomotives and 50 additional boilers annually is to be built by Government of India near Calcutta. First locomotive is scheduled for completion at end of 1950. This will be India's second locomotive works, first (Tata Locomotive & Engineering Co.) to be in full operation of boilers by next September.

WAA proposes to sell surplus machine tools to original builders at so-called fixed prices ("25%-off-market") minus commission of 12½% on price paid for each machine.

(Further news on pages 221-236.)

Cut Metal Better and Faster at Lower Cost



LONGER TOOL LIFE

LOWER cost, as a result of longer tool life, is one of the important advantages you can depend on when you use *Texaco Cutting and Soluble Oils. "Drill life increased from 15 to 70 pieces,"* says one user. Another reports *drill life tripled.* And similar outstanding results are reported for other machine tools of all kinds.

Texaco Cutting, Soluble and Grinding Oils effectively lubricate and cool. They prevent chip welding and wheel loading – assuring more cuts per tool grind. They also permit faster cutting and assure a finer finish.

Whatever the metal or method of machining it, there are *Texaco Cutting, Soluble and Grinding Oils* made to assure greater output, better quality, fewer rejects, and lower costs.

Get the Texaco oils you need, plus specialized Lubrication Engineering Service, by calling the nearest of the more than 2300 Texaco distributing plants in the 48 States.

Or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO CUTTING, SOLUBLE AND GRINDING OILS FOR FASTER MACHINING

Tune in . . . TEXACO STAR THEATRE presents the NEW EDDIE BRACKEN SHOW every Sunday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

Portal-to-Portal Pay

In its suits to recover portal-to-portal pay from individual companies, the CIO appears to be proceeding on the basis of trying to destroy industry rather than live with it.

What other conclusion can one reach? The United Automobile Workers, for example, have filed claims against the Ford Motor Company for a total of $270,320,000. That is a recklessly high sum to seek, no matter how big a corporation may be.

Someone should explain to the CIO the economic facts of life. Someone should tell its officers that not even the strongest company in the world can afford to pay out several hundred million dollars for portal-to-portal pay alone.

On second thought, we hardly believe this explanation is necessary. It is more likely that the CIO chiefs are deliberately staging a gigantic bluff. Yet they have the unmitigated gall to say that the suits are not "hold-ups," but are simply a demand that "workers be granted the full protection of a law that was originally enacted for their benefit."

How can they make such a statement when it is generally acknowledged that the authors of the Wages-and-Hours Law did not have in mind, even remotely, portal-to-portal pay?

If they had had it in mind or if union chiefs had been aware that the law covered portal-to-portal pay, the hullabaloo over the issue would have been precipitated long ago.

It must be obvious to the most slow-minded labor leader that the courts will not sustain absurdly large claims which, if allowed, would help wreck individual companies. Payments of such amounts would be harmful to everyone: the companies, the employees, the community, the entire economy.

Even the lawyer who fought the Mount Clemens case to a successful conclusion in the United States Supreme Court is admonishing the unions to go slow. "It is not necessary and it is unwise," says Edward Lamb of Toledo, "to specify these fabulous and reckless sums. They frighten industry and may stir Congress to adopt restrictive legislation."

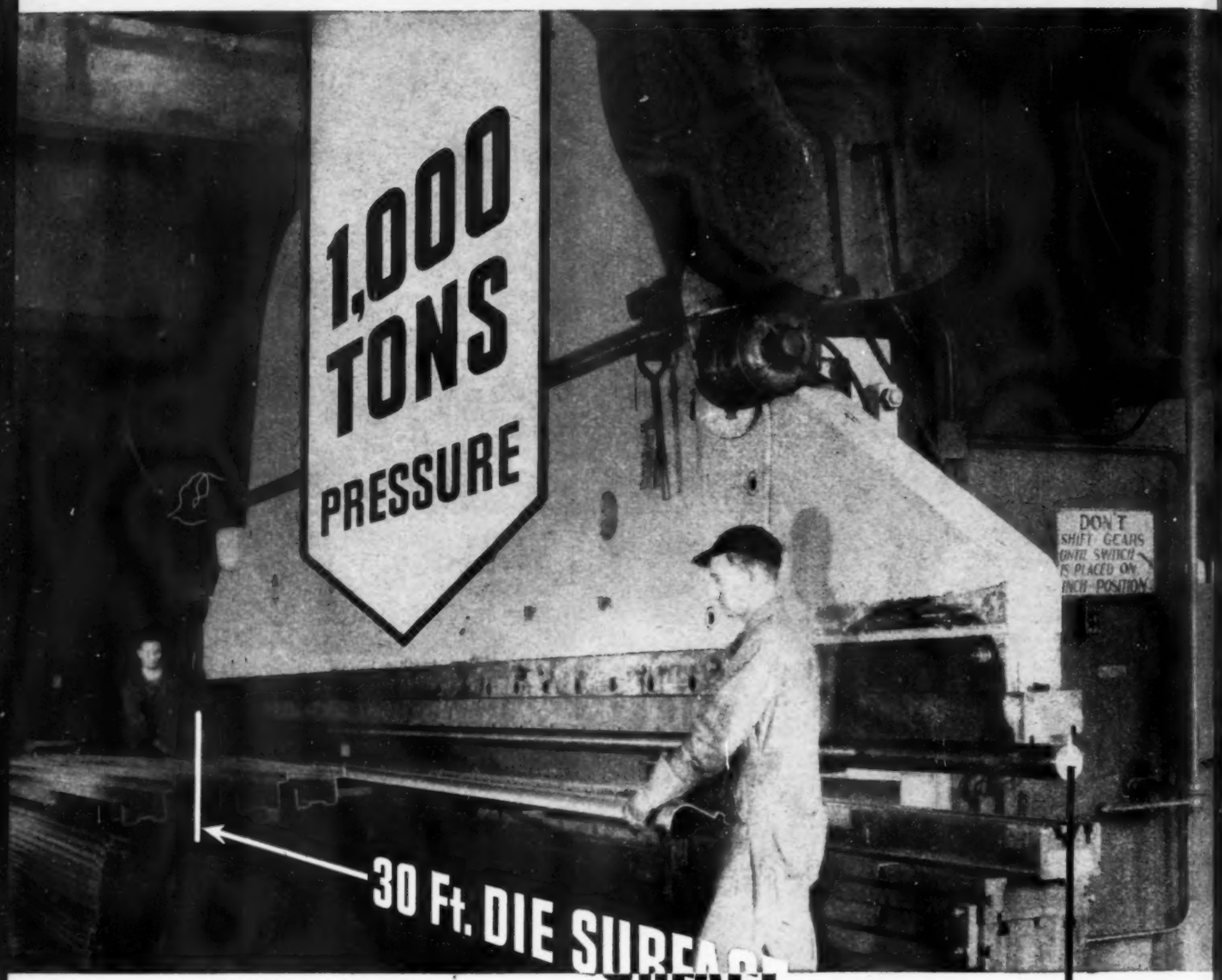
Portal-to-portal pay has already become a political issue, partly because unions have been so unreasonable in their approach to a fair settlement. An attempt will be made in the new Congress to outlaw such pay altogether.

Here is an issue which can do either of two things. It can continue to be handled clumsily and in a sledge-hammer way by the CIO, causing great damage to good relations between management and employees. Or it can be negotiated in a sane and sensible manner and a fair settlement be worked out quietly.

The only logical solution, as long as its legality is upheld by the highest court in the land, is to make it part and parcel of the collective bargaining procedure of each company. Conditions will vary with each individual situation.

Portal-to-portal pay should be relegated to its proper place as only one of many issues to be settled by compromise across the bargaining table. It is time for the CIO, therefore, to stop talking foolishly and wildly in tens and hundreds of millions of dollars, which it probably never will collect.

Burnham Finney



Photo—Courtesy of American Rolling Mill Company

The Cincinnati 500 Series Press Brake has the power and rigidity for accurately forming **single** bends 15′ to 20′ long in **heavy plate**—or forming **multiple** bends 25′ to 30′ long in LIGHT PLATE and SHEETS.

Our Engineering Department is ready to discuss with you the possibility of the profitable use of these powerful machines, whether for the forming of tanks and structural members, machinery parts, or general fabrication.

Let our representative show you a Cincinnati installation in your neighborhood.

Write for Brake Catalog No. B-2, suggesting many uses, and illustrating the Cincinnati line.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

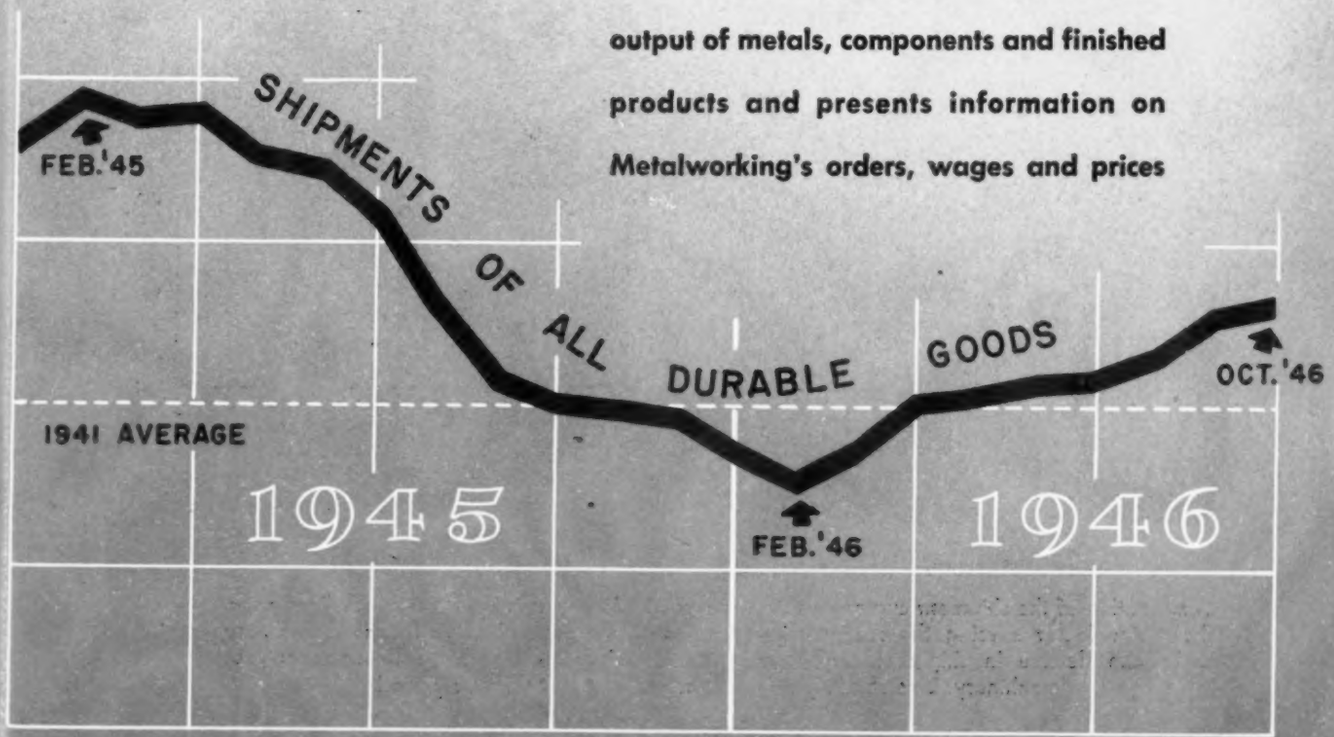
American Machinist

1947

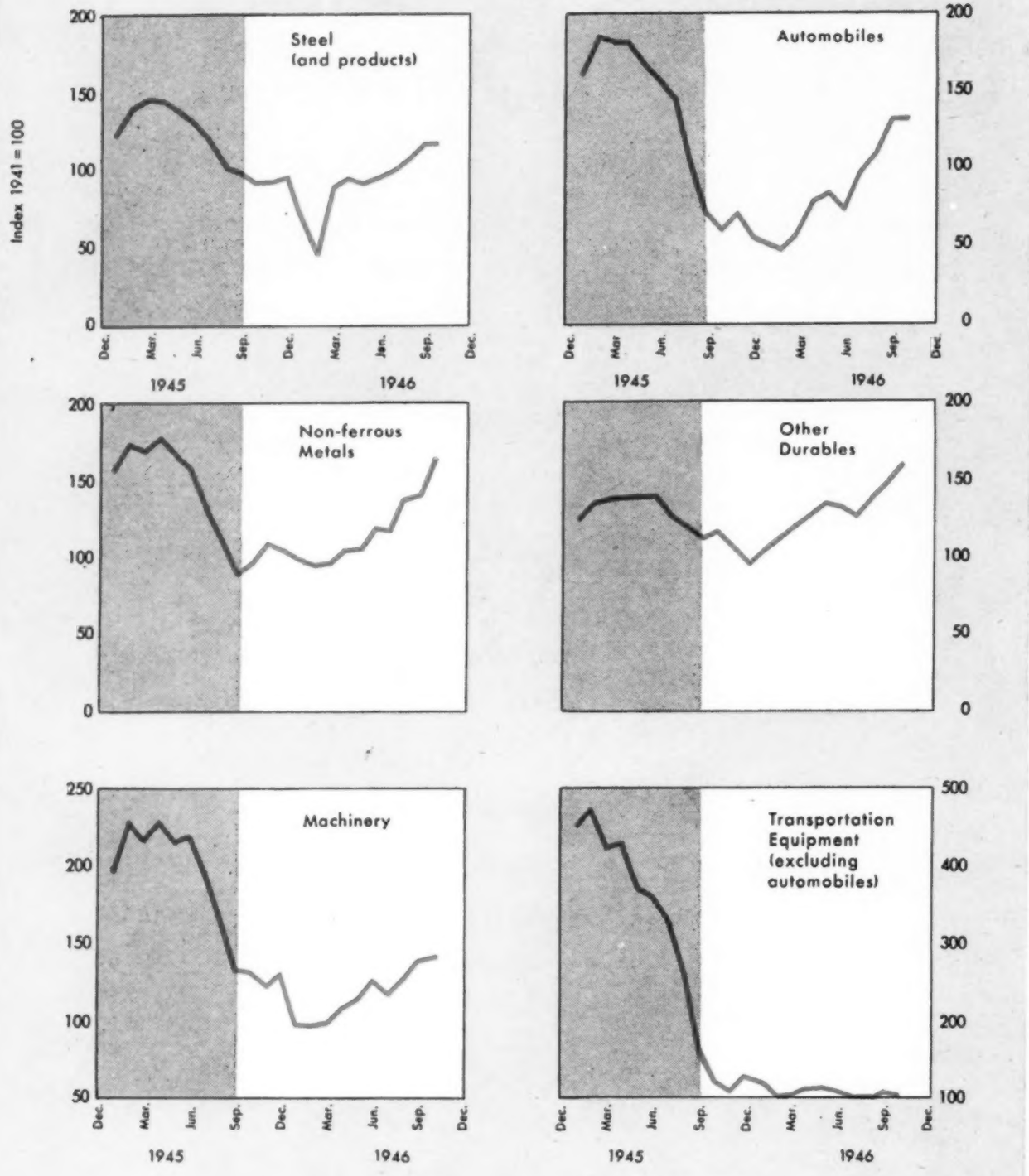
Appraisal of Metalworking

WITH A STATISTICAL SUMMARY

● Where is Metalworking today and where is it headed? The facts and figures set forth in the succeeding 15 pages provide the basis for an answer. American Machinist herewith summarizes data on machine tools and other production equipment, on output of metals, components and finished products and presents information on Metalworking's orders, wages and prices



SHIPMENTS REACHING FOR POSTWAR HIGHS



Source: Dept. of Commerce

Combination of the shipment curves on this page produces the curve on the preceding page. The major factor causing the reconversion drop-off in the general curve thus is shown here to be the decline in shipments of transportation equipment, and to a lesser extent, of machinery. Blue shading on these charts indicates the war period

BIG YEAR LOOMS FOR METALWORKING AS NEW PEACETIME HIGH IS REACHED

THE start of the New Year finds the metalworking industries hitting new peacetime highs in orders, supplies, employment, production and sales. No wonder, then, that extraordinary activity seems so assured for 1947.

But prospects are hardly so clear, sharp or simple. In many metalworking lines, supplies, inventories, and output are still distorted; strikes once more loom as a great threat; and spiraling wages and prices cast an ever longer shadow over 1947 markets. No wonder, then, too, that there is concern in so many quarters over prophecy of a 1947 recession.

1947 Expectations

Despite these problems, 1947 can be expected to prove a far better year for Metalworking than 1946, on almost every count. Today we are running a bit ahead of the best 1946 rates and well ahead of the 1946 total which was badly shrunken in the first half-year. Even with strikes or recession, if they are not of disastrous proportions, 1947 should end up well above 1946. This is confirmed by simple statistical comparisons on 1946 activity in durable-goods industries:

Monthly Averages, % of 1941

	1st Half	2nd Half	Year
Production (physical)	87	105	96
Shipments (dollars)	94	125	110

It is no secret that many metalworking groups failed to produce in the past year the high volume anticipated. Steel mills lost to strikes 13 millions of their expected output of 80 million ingot tons. But nowhere was this fact demonstrated more dramatically than in the automobile industry: its output of 3.2 million cars and trucks was a bitter disappointment, little over a half of the hoped-for peak. Almost all year car makers were hounded by the bad luck of strikes and irregular deliveries of materials and component parts. The same situation prevailed in many other quarters.

It brought about a reappraisal not only of the final goal for 1946, but also of the prospects for 1947. It soon became evident that for many companies the determinant of their 1947 production would be the tonnage of metals which they could get, particularly of steel. Accordingly, many firms reexamined their 1947 projected operations and cut them down somewhat to fit the supply of steel promised. General Motors, for one, sharply pared its gigantic expansion plans. Others did the same.

Nevertheless, the automobile industry looks to build as many as five million cars and trucks during the coming year. That is a healthy stepdown from original hopes for more than six million units. But it would still be an excellent record. One can count on one hand the years in the industry's history when it made five million vehicles.

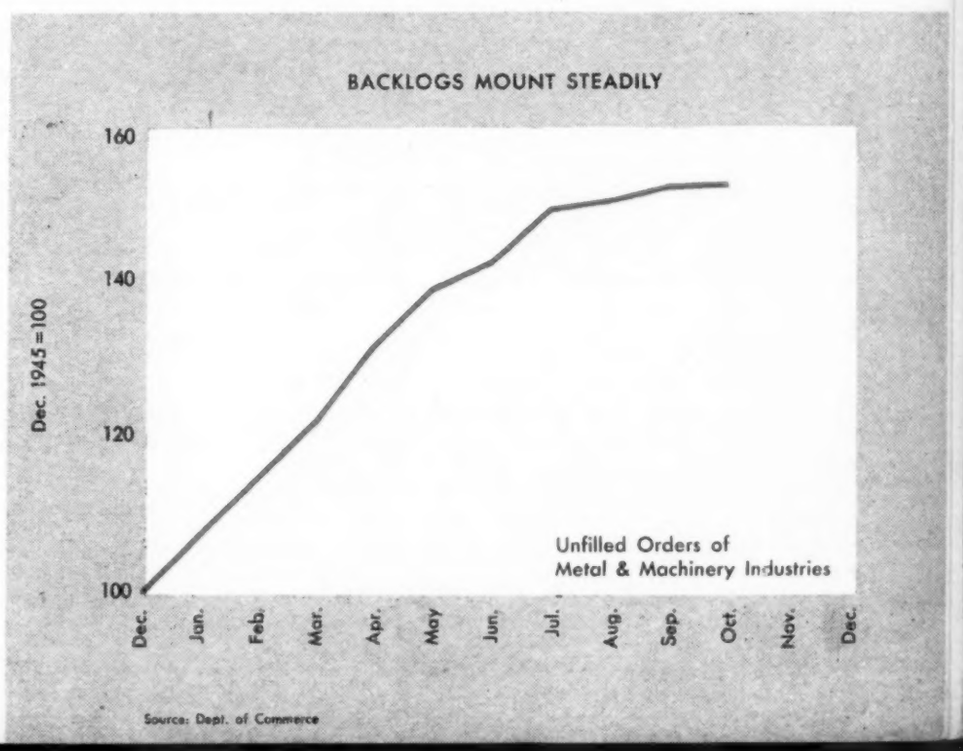
In farm machinery the goal now is for a new record of a billion dollars of production, as against two thirds as much in 1946. Such other metalworking industries as railroad equipment builders and refrigerator makers expect to do at least as well proportionately. Other machinery producers will likewise be very busy next year: mechanical and hydraulic press companies have large order books; makers of plastic injection molding machines are far behind in filling customers' requirements; package machinery builders are so hard-pressed they have to farm out work; textile and printing machinery companies have full-capacity operations projected far into the future, and so it goes.

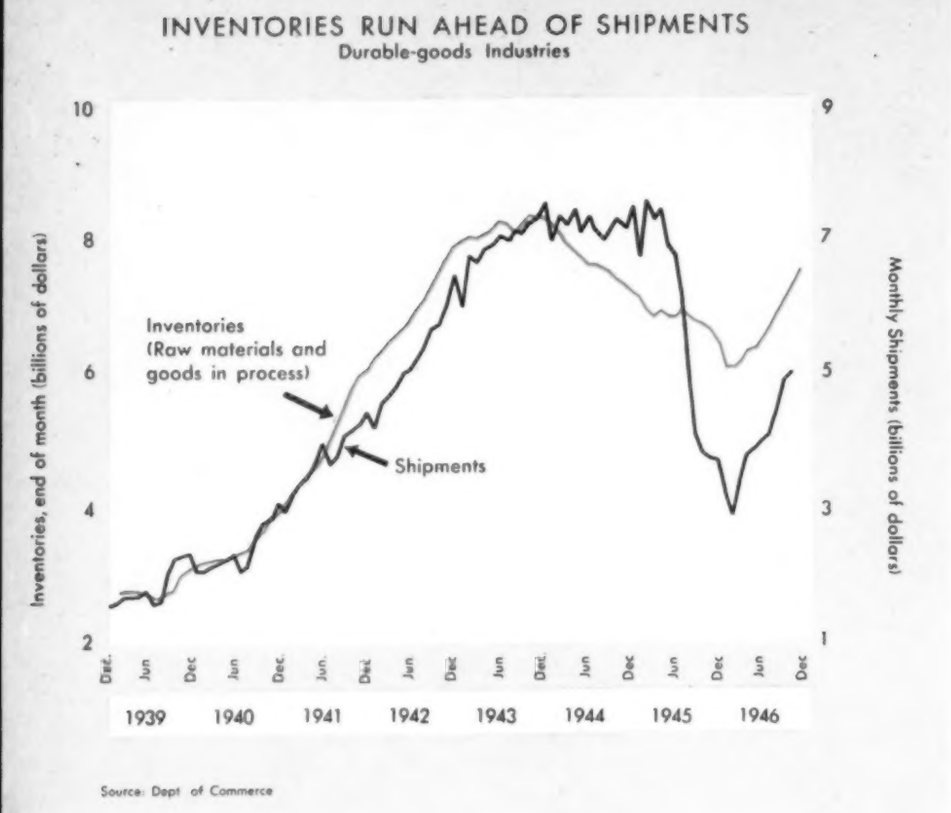
It is clear, therefore, that the setting of 1947 goals is conditioned in the first place on supply—on the output that can be built up from basic materials. In turn, supply is conditioned primarily on labor and possible work stoppages.

In all other respects the supply outlook is brightening rapidly. Metals production for civilian products has struck new highs in recent months in almost every case, as data on pages 111 show. Just before the 1946 year-end, for example, steel output reattained the 1941 rate of over 80 million ingot tons—and a smaller share of the tonnage now goes to military use. Mill shipments of sheet and strip just lately have been rolling at nearly one-sixth a faster clip than in 1941. Copper has gotten back up to prewar volume, aluminum is running far ahead, and plastics are moving at half a million tons a year, which dwarfs any peacetime experience.

Further gains are in sight. Expanded capacity will come into operation in such cases as flat rolled steel. And decontrol of prices will bring in more lead, scrap steel, and

ONLY AFTER THE SHARP SPURT in recent months have shipments caught up with new orders in the metalworking industries. Consequently, backlogs of unfilled orders during 1946 swelled to one-half more than the volume at the end of 1945. This fact is no guarantee of future demand, however, because there are always duplications in order books and because cancellations could come fast if business headed for a spill. Even so, it is an important fact that Metalworking's order position seems so strong





INVENTORIES HAVE RISEN almost as rapidly as shipments since early 1946. They are now abnormally high—a crucial fact to keep in mind in appraising Metalworking's position today. During the postwar periods of strikes and reconversion, shipments fell off more than inventories. Industry was stocking up on civilian materials while feeding war goods back to the federal government on contract terminations. In normal times, inventories of raw materials and goods in process go up in step with shipments. That's what happened in 1939-1941. By contrast, in 1942 plants hoarded materials, then during the rest of the war they got through with minimum stocks as WPB allocations took effect to assure a flow of supplies

similar materials to the market.

Moreover, metalworking lines have not quite caught up with the existing flow of supplies. The heavy industries have been adding substantially to inventories which already are larger than needed for current operations. The materials and parts that have been pouring into stockpiles will be available for stepping up finished-products volume before very long.

Price decontrol will help free this inventory flow in two ways. First, producers have been stocking up on plentiful materials, awaiting scarce key items; their output had been held back by rigid price ceilings, but now will be more easily obtained. Second, industry will be less disposed than before to hoard goods in expectation of price rises—because prices have taken their expected upward twist.

Naturally, strikes may yet kick the props from under this supply outlook. But it is worth noting that Metalworking is better prepared to recover than it was a year ago. It can fall back on an inventory cushion nearly one half larger than at the start of 1946 (washing out current figures for price rises and year-ago totals for unusable war materials). Moreover, having geared civilian operations so high already, it can regear after strikes more quickly.

Labor Peace Vital

In short, if labor does not take too big a toll, supply will begin to approach the volumes needed to meet high production goals. This does not mean there will be enough of all materials and parts to go around to feed our war-expanded metalworking capacity. It does mean that, disastrous strikes always excepted, shortages should be far less severe, supplies less troublesome.

Apart from supply, labor's second round is apt to slice appreciably into demand. Indeed, in the second half of 1947 the metalworking problem may shift increasingly to one of market, because of the wage and price spiral.

Metalworking may have little to do with causing any such 1947 recession in business, but some branches of Metalworking can't help being affected by it if it happens. The areas that economists are looking into for possible trouble are farm products, "soft goods" like clothing, housing, and one or two others.

If weakness developed in these lines, normally it would affect such things as tractors, textile machinery, or oil burners, just to take a few examples. Of course, there is an abnormal demand for these and all other such durable goods that could not be produced in accustomed volume during the war. Yet there is no insurance policy against repercussions on Metalworking from some such business dip arising outside these industries themselves.

Danger Signs

Even within Metalworking, however, there are a couple of possible danger signs. Many prices have risen sharply already: new automobiles, for example, cost almost one-half more than in 1941. And wages and prices are still on the move. Prices have not quite completed readjustment to the first round of wage boosts, following decontrol; the second round will push them higher. As it is, backlogs of orders have just about stopped growing at current rates of shipments, and major price changes to come can shake out orders now on the books. Meanwhile, as we have seen, supply will increase, if strikes are not crippling. Thus, quite a few markets where demands have seemed extraordinarily urgent can be squeezed sharply by these forces.

There are few cases of such a collapse in demand thus far, certain lines of jewelry being perhaps the outstanding example. Likeliest candidates for trouble, obviously, are those in which both output and prices are running very high. Thus in automobiles, prices are up but output is not; in farm machinery, output has expanded but prices have not gone too far. Some of the consumer household appliances, however, have advanced sharply on both scores, as have many hardware lines. Among producers' equipment, most lines that held high in the war have been off considerably anyway, whereas most war-curtailed lines still seem strong despite recent gains in production.

This appraisal of market strength today but possible trouble tomorrow is confirmed by a general economic analysis of sales of metalworking products (charted below). Expenditures on consumer durable goods at the end of 1946 were running 20% lower, and capital outlays on plant and equipment were running 15% lower, than the levels which normally should be reached at current volumes of national income and business activity. Because the war built up huge backlogs of needs when civilian goods could not be made, markets could absorb sales of durables somewhat above normal. Allowing for this fact, recent sales levels run perhaps as much as 25-33% below where they could be. This confirms market strength.

This strength will be reduced later in 1947 by three factors. Durables output will rise and permit more sales. Durables prices will rise, probably more than farm or apparel prices, skimming off more of the nation's dollars. And activity may fall off in some nondurable industries, shrinking the national market. It's anybody's guess whether all this will eat up the present 25%-33% market margin for durables, but such a development is possible.

The best market protection for any industry, of course, is cost and price reduction, and metalworking lines are particularly anxious for it now in light of the wage situation. As a result, there are strong trends in this direction.

Typical Trends

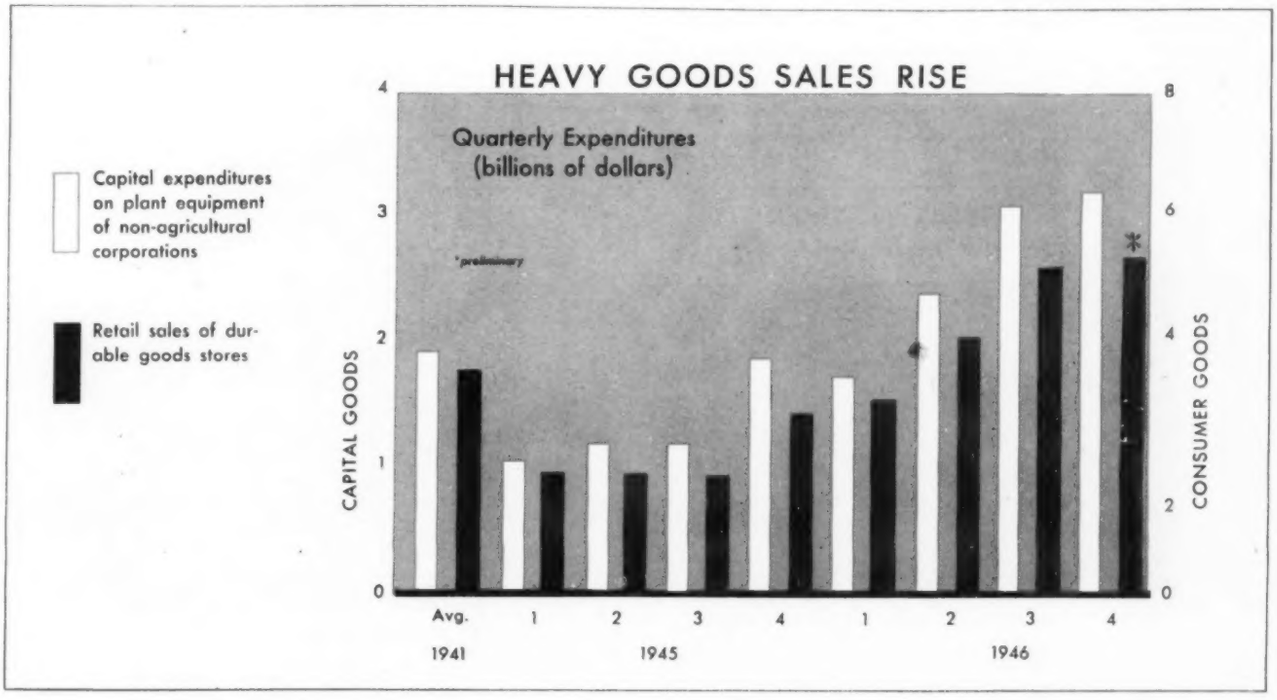
One takes the form of substantial new orders for machine tools. An increasing number of machine-tool companies are completing redesigns of their machines or are adding new machines to round out their lines. This is a strong stimulus to buyers, despite the large surplus of older types of equipment from the war.

Another works to the advantage of the precision instrument companies. There was a pronounced trend during the war towards greater precision in manufacture, a trend which is carrying over into postwar days as a permanent policy. For this reason the instrument industry will continue on a higher plane of activity than heretofore.

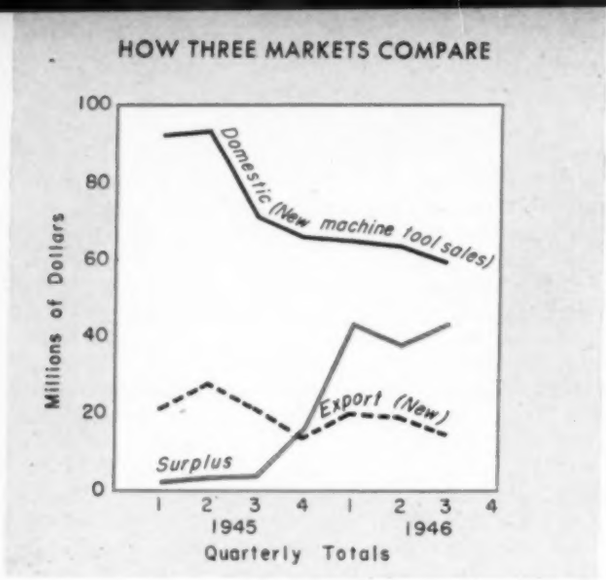
Still another trend is better handling of materials within metalworking shops. Machining methods have been so speeded up that often today the amount of machining work which can be done is determined by the time it takes to get the workpiece into and out of the machine. A growing list of companies is looking closely at materials-handling methods with the end in view of lowering production costs.

Decentralization of operations is still another notable shift in the same direction. It is outstanding in the electrical equipment field. Many manufacturers have come to the conclusion that it pays to establish smaller producing establishments in smaller communities than to concentrate in huge plants.

With the confidence inspired by such a forward-looking attack on their problems, metalworking industries are looking ahead to 1947 with great hopes, conscious that if the labor problem can be surmounted, the New Year should see the most amazing all-around performance in heavy industry ever chalked up in peacetimes.



SALE OF CIVILIAN PRODUCTS of durable-goods industries have picked up rapidly since the end of the war, with capital goods in the lead. Consumer goods, however, appear to be moving ahead faster now. This reflects more the state of durable-goods production than it does of demand, because sales volumes until now have been limited mainly by output. Dollar figures, incidentally, include price increases; in physical volume, capital goods seem to be above 1941 volumes, with consumer goods still below. (Note: Consumer durable sales total more than capital expenditures in dollars, but only because of retail markups; otherwise, volume in the two groups would be more nearly comparable. Retail sales take in some non-metal items like furniture, but fail to count sales of metal products made through outlets like department stores. Capital expenditures cover outlays on construction—even of such things as night clubs or restaurants—as well as the more important equipment items.)



• MACHINE TOOLS — New

PRODUCTION of new machine tools in 1946 exceeded all prewar years by a healthy margin, even after allowances are made for differences in prices now compared with then. Shipments to domestic customers have steadily declined since the war's end, but still have not shrunk to the level that many people in the industry had anticipated. Prospects are that demand will continue well above the prewar high during 1947. Sales would be higher if it were not for competition from surplus government machines. Exports, by contrast with domestic business, have held up very well and promise relatively substantial volume the coming year. They are aided by the absence from the foreign market of the German machine-tool industry, which before the war was U. S.'s most powerful competitor. The drive for lower manufacturing cost and further mechanization in this country and the rehabilitation and industrialization programs proposed by other nations will benefit the machine-tool industry during the next few years.

EXPORTS — AND WHERE THEY GO
(Thousands of Dollars)

YEAR	MACHINE TOOLS	ALL METALWORKING EQUIPMENT						
		TOTAL	BRAZIL	CANADA	FRANCE	JAPAN	U.K.	U.S.S.R.
1939	91,236	117,474	236	6,413	18,806	24,839	33,164	18,669
1940	208,866	255,685	903	23,811	31,795	23,843	132,589	23,879
1941	184,988	235,027	2,393	69,712	.....	969	129,870	6,377
1942	159,421	237,681	1,274	56,757	.....	.....	98,561	49,477
1943	237,433	346,467	7,242	37,479	.....	.....	96,515	157,384
1944	163,603	271,558	9,426	16,796	.....	.....	30,753	187,759
1945	85,000	152,534	12,638	17,857	2,827	.....	11,982	84,907
1946*	55,890	127,095	7,261	13,244	24,255	.....	7,034	35,567

*9 months total
Note: Destinations of machine tool exports are not available; destinations of all metalworking equipment are indicative of shifts in markets, however, because machine tools constitute the largest group in this total. The proportion of machine tool exports to total metalworking has been declining in recent years
Source: Metalworking equipment exports from the Department of Commerce. Machine tool exports for 1939-1944 from War Production Board; for 1946 from National Machine Tool Builders Association; 1945 estimated by American Machinist from above two sources.

ORDERS VS. SHIPMENTS
(In Thousands of Dollars)

MONTH	SHIPMENTS	% FOREIGN	NEW ORDERS[1]	% FOREIGN	CANCELLATIONS[1]	% FOREIGN	UNFILLED ORDERS[1,2]	% FOREIGN
1945								
Jan.	37,353	13.6	57,872	N.A.	3,030	N.A.	274,295	N.A.
Feb.	36,018	16.5	56,182	N.A.	3,665	N.A.	288,803	N.A.
March	40,045	24.2	53,493	N.A.	5,838	N.A.	296,859	N.A.
April	40,170	26.9	46,933	N.A.	22,059	N.A.	282,963	N.A.
May	39,825	27.9	42,590	N.A.	15,597	N.A.	269,784	N.A.
June	41,040	15.0	34,428	N.A.	13,763	N.A.	249,813	N.A.
July	32,504	N.A.	27,715	N.A.	12,518	N.A.	234,451	N.A.
Aug.	32,500	N.A.	26,889	N.A.	24,279	N.A.	198,365	N.A.
Sept.	27,300	24.0	22,696	13.1	8,979	14.1	185,519	20.3
Oct.	31,200	19.4	26,352	18.4	9,020	20.7	173,807	19.1
Nov.	26,084	17.5	23,729	20.5	2,476	15.8	170,702	19.8
Dec.	23,276	20.3	31,610	42.4	1,748	15.5	178,972	23.9
1946								
Jan.	30,263	27.4	30,580	38.3	2,898	15.7	178,141	27.9
Feb.	26,949	25.0	21,672	30.1	1,881	24.3	174,143	29.0
March	27,326	24.4	28,302	25.2	2,003	34.2	175,360	29.3
April	28,108	25.2	32,647	20.5	1,467	31.6	180,606	28.3
May	26,580	27.4	28,496	22.3	3,232	18.0	182,889	27.7
June	28,580	24.0	28,491	32.7	1,633	22.9	183,457	29.7
July	22,360	27.6	26,476	29.6	2,534	10.5	185,058	29.1
Aug.	26,911	22.5	26,291	22.4	4,461	12.2	182,439	29.5
Sept.	25,468	21.2	23,088	21.2	3,048	14.1	179,796	29.7
Oct.	26,517	26.9	22,664	26.0	1,607	35.2	175,984	29.6
Nov.	23,603	29.6	19,138	33.6	1,341	13.9	168,997	30.2

[1] *Based on reports of 93% of the industry* [2] *At end of specified period* *N.A.—Not available*
Source: National Machine Tool Builders Association, War Production Board

OUTPUT BY YEARS 1914-1946
(Dollar Value)

YEAR	SHIPMENTS
1914	$35,300,000
1915	103,400,000
1916	141,400,000
1917	168,500,000
1918	220,600,000
1919	161,000,000
1920	151,500,000
1921	36,000,000
1922	43,300,000
1923	79,300,000
1924	69,600,000
1925	86,700,000
1926	105,000,000
1927	87,000,000
1928	128,000,000
1929	185,000,000
1930	96,000,000
1931	51,000,000
1932	22,000,000
1933	25,000,000
1934	50,000,000
1935	85,000,000
1936	133,000,000
1937	195,000,000
1938	145,000,000
1939	200,000,000
1940	440,000,000
1941	775,000,000
1942	1,321,748,000
1943	1,180,216,000
1944	497,465,000
1945	407,315,000
1946	315,000,000*

**Estimated*
Source: National Machine Tool Builders Association, War Production Board

THE staggering size of the surplus machine-tool problem is shown by the data on this page. Machine-tool builders produced in the six-year period 1940-1945 inclusive over 1,100,000 units. That is more machine tools than were installed in American industry when *American Machinist* took its regular five-year inventory of metalworking equipment at the beginning of 1940.

Even after allowance is made for some 235,000 machines which were shipped abroad, for 250,000 purchased by private manufacturers with their own funds, and for 220,000 which have been bought or will be bought from the government by contractors in possession, the government still has on hand 395,000 units to be disposed of in one way or another.

Surplus 395,000 Units

Up to now about 250,000 machine tools have been turned over to the War Assets Administration to be sold as surplus. WAA roughly estimates that around 145,000 machines are yet to be declared surplus by government agencies, or 36% of the total. As of November 1, WAA had sold over 91,000 machine tools for delivery here and abroad. Though this is a substantial figure, it makes only a modest dent in the stocks.

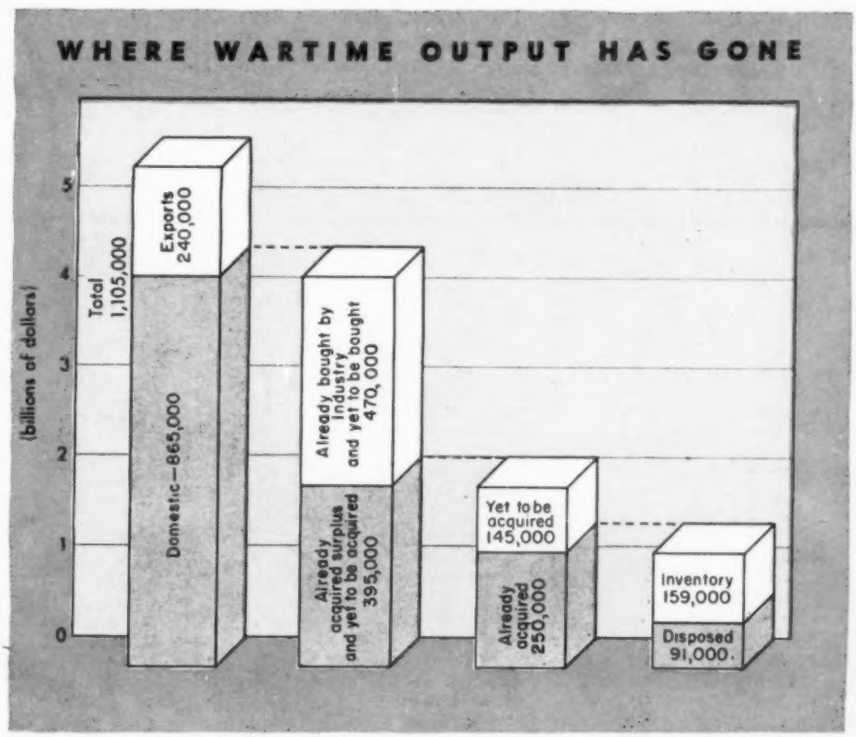
A drive is on to put into strategical reserves for the armed services a sizable quantity of good surplus machines ready for a possible future emergency. The machines to be selected would be not only those which have special wartime application and would take a long time to produce, but also those classified as general-purpose. It is possible that this reserve may take as many as 100,000 machine tools; and it will be 50,000 or more as a minimum.

While this action will aid our nation's defense and at the same time help relieve the surplus problem, a terrific disposal job will still remain. Thus far, under the Clayton formula, the government has realized in cash sales close to one-half the original price of machine tools sold as surplus. This high average cannot be maintained, however, from now on, because the bulk of the remaining surplus is being offered at cut-rate prices which run around 25%-30% of the original prices, and for all other machines the Clayton price itself decreases month by month as the tools get older.

SCORE CARD ON SURPLUS
(In Thousands of Dollars)

PERIOD	ACQUISITIONS (at cost)	DISPOSALS				INVENTORY (at cost)
		TOTAL (at cost)	SALES		MISCELLANEOUS (at cost)	
			ORIGINAL VALUE	RECOVERY		
Cumulative from organization thru May 1945	100,145	49,097	49,094	31,778	3	51,048
June	8,355	4,349	4,303	2,268	46	55,055
July	10,083	3,268	3,105	1,552	163	61,872
August	6,862	3,436	3,000	1,017	436	65,298
September	23,305	2,287	2,510	1,031	−223	86,316
October	59,393	6,261	6,112	2,782	149	139,448
November	89,131	11,316	10,403	5,123	913	217,263
December	96,523	16,793	17,696	8,353	−903	296,993
Cumulative Total Thru 1945	393,797	96,807	96,223	53,904	584	.....
January 1946	201,523	38,100	37,993	17,727	107	384,903
February	77,932	19,725	19,416	9,313	309	443,110
March	108,542	33,484	33,146	16,009	338	518,167
April	133,562	12,133	10,753	1,668	1,380	639,597
May	77,132	33,377	30,757	14,414	2,620	683,352
June	53,983	49,396	46,508	21,940	2,888	687,939
July[1] and August[1]	73,000	60,000	60,000	30,000	.....	.....
September	23,164	30,126	30,126	13,212	.....	700,092
October	40,840	35,561	35,561	15,891	.....	698,705
10 mo. Total	789,678	311,902	304,260	140,174	7,642	.....
Cumulative Total	1,183,475	408,709	400,483	194,078	8,226	.....

[1] *July and August figures are estimated*
Source: War Assets Administration



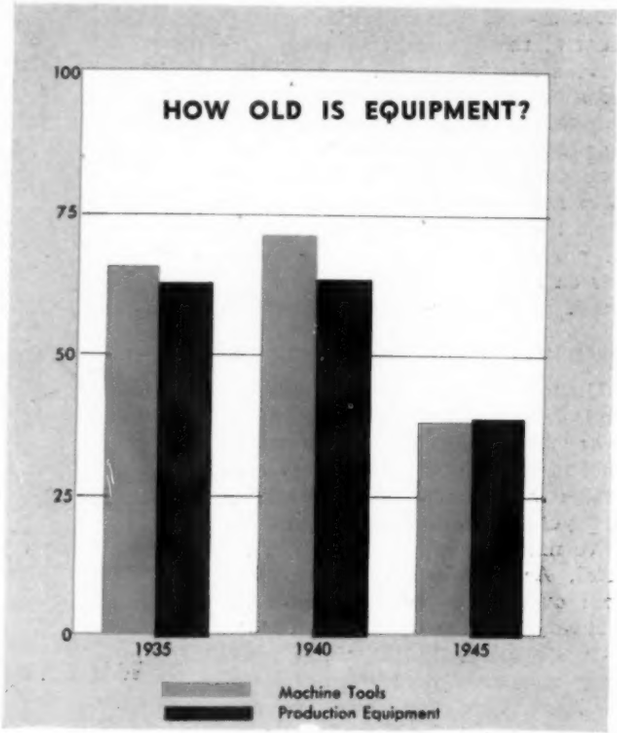
Surplus disposals lately have been close to new-tool sales in value and have been higher in numbers of units. Even so, WAA has not started to catch up with itself on surpluses. New acquisitions continue to outstrip disposals, with stocks in warehouses, factories and elsewhere piling up.

• INSTALLATIONS OF TYPICAL

THE war has rejuvenated the metalworking equipment of America, at least in the sense that much less of it than before the war is as old as 10 years or more. The age level has not been brought down uniformly, however, as the 10-year percentages for individual types of equipment clearly show. And because much of the older equipment is quite old—at least to judge from the charted ages of machine tools generally—there are still a good many gaps in the modern façade of equipment installations.

Metalworking industries differ among themselves, quite naturally, in the stress they place on different machines. Auto and aircraft industries, for example, boast a far larger share of the country's machine tools than they do of other typical production equipment—whereas producers of miscellaneous heavy products own a much smaller percentage of machine tools than they do of other equipment. Moreover, where machine tools are important, more of them are younger, on the average, than the other equipment—and the reverse is true of average age where the emphasis lies not on tools but on the other machinery.

Geographically, of course, the nation's metalworking industry is concentrated first and foremost in the midwestern industrial states of Ohio, Indiana, Illinois, Michigan, and Wisconsin, and secondarily in the eastern states running from Pennsylvania to Maine. In the former region are bunched half the nation's machine tools and almost as much of its other typical production equipment, whereas the eastern shares in both cases run nearer one-third of the total. The south as a whole has but 5% of the machine tools and 10% of the other equipment, and the Pacific states just about comparable percentages, with the minor remainder scattered here and



INSTALLATIONS BY INDUSTRY

MACHINE TOOLS		INDUSTRY	OTHER TYPICAL PRODUCTION EQUIPMENT	
TOTAL	% OVER 10 YRS. OLD		TOTAL	% OVER 10 YRS. OLD
31,632	55%	Agricultural Implements	25,260	46%
276,466	2%	Aircraft and Aircraft Engines	57,475	6%
176,616	40%	Motor Vehicles	58,861	46%
67,071	31%	Motor Vehicles, Bodies & Parts	44,667	45%
41,089	49%	Construction, Mining & Oil Well Equipment	52 550	30%
56,808	54%	Materials Handling & Power Transmission Equipment	46,461	47%
45,568	47%	Domestic Electrical Appliances & Equipment	24,346	47%
105,096	47%	Industrial & Commercial Electrical Equipment	71,960	44%
26,939	25%	Engines, Turbines & Water Wheels	8,934	41%
96,943	55%	Consumer Fabricated Metal Products	104,019	63%
293,120	46%	Industrial Fabricated Metal Products	182,811	47%
58,958	56%	Processing & Servicing Machinery	29,820	40%
84,042	36%	Precision Mechanisms	23,725	38%
91,430	45%	Metalworking Machinery & Equipment	29,391	41%
17,303	62%	Business Machines	5,519	62%
44,670	15%	Army & Navy Arsenals	23,400	9%
106,457	55%	Heavy Equipment, not elsewhere classified	233,780	28%
37,304	42%	Railroad Equipment	41,336	47%
17,235	59%	Job-Shop Products	10,052	45%
36,386	58%	Textile & Clothing Machinery	14,028	54%
1,711,137	38%	Total All Industries	1,088,395	39%

Source: American Machinist 1945 Inventory of Metalworking Equipment

there through what are essentially farming states. By age, eastern installations are generally older than those elsewhere, while the midwestern industrial section has younger machine tools than the rest of the nation but older production equipment of other types.

These statistics, including those on installations in small and large plants, and machine-tools scrapping policy over previous years, are summarized from the more detailed and extensive studies published by *American Machinist*, "The 1945 Machine Tool Inventory" and "The 1945 Inventory of Metalworking Equipment (other than machine tools), which appeared about a year ago."

INSTALLATIONS BY TYPE

MACHINE TOOLS

	TOTAL	OVER 10 YEARS OLD
Boring Machines	50,337	17,180
Broaching Machines	9,701	3,416
Centering Machines	3,458	1,894
Cutting-off Machines	75,756	25,922
Drilling Machines	338,182	127,248
Gear-cutting Machines	55,034	16,428
Grinding Machines	366,464	109,147
Honing & Lapping Machines	16,134	2,119
Keyseaters	4,466	3,20?
Lathes	418,501	169,581
Milling Machines	171,763	63,986
Pipe Cutting & Threading Machines	10,241	5,014
Planers	16,427	12,813
Polishing & Buffing Machines	57,384	23,574
Rifling & Rifle Reaming Machines	1,486	500
Shapers	36,703	23,579
Threading Machines (except pipe)	34,978	13,963
Other Machine Tools	44,122	32,619
TOTAL	1,711,137	652,185

Source: American Machinist 1945 Inventory of Metalworking Equipment

OTHER TYPICAL PRODUCTION EQUIPMENT

	TOTAL	OVER 10 YEARS OLD
Air Compressors	35,785	15,850
Baking & Drying Ovens	17,297	8,494
Bending Machines	41,033	19,147
Cranes	100,949	47,017
Forging Machines	30,287	18,677
Heat-treating & Hardening Furnaces	55,822	16,762
Hoists	171,726	58,294
Oil Extracting Machines (from chips)	3,274	1,179
Parts—washing machines	11,006	1,645
Plating equipment	26,713	6,870
Presses	256,030	153,089
Riveting Machines (not portable)	24,652	8,697
Shears	34,456	20,386
Swaging Machines	4,574	2,893
Tumbling Barrels	28,320	16,411
Welding & Cutting Machines	247,471	37,685
TOTAL	1,088,395	433,096

Source: American Machinist 1945 Inventory of Metalworking Equipment

INSTALLATIONS BY PLANT SIZE

Machine Tools

	TOTAL	% OF TOTAL	AVG. NO. TOOLS
27,343 Small Plants[1]	757,341	45.5	28
2,017 Large Plants	909,126	54.5	455
Total	1,666,467[2]	100.0	483

Other Production Equipment

27,343 Small Plants[1]	539,268	52.8	19
2,017 Large Plants	525,727	47.2	260
Total	1,064,995	100.0	279

[1] *Plants employing up to 500 persons*
[2] *Excluding Army and Navy Arsenal Equipment*

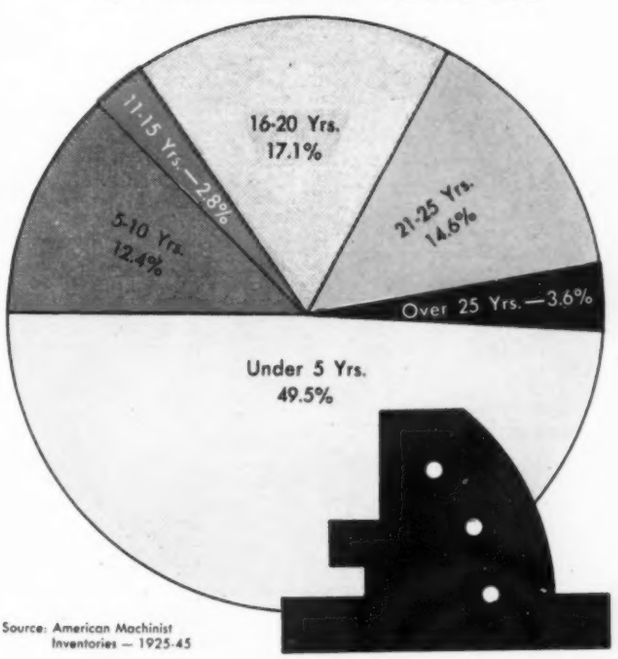
Source: American Machinist 1945 Inventory of Metalworking Equipment. These national data have been adjusted to show the relative equipment holdings by size of plants.

1930-1945 MACHINE-TOOL SCRAPPING POLICY

BUSINESS CONDITION	PERIOD	NUMBER OF TOOLS SCRAPPED[x]	CUMULATIVE TOTAL
Depression	1930–34	82,000	82,000
Recovery	1935–39	285,000	367,000
War	1940–44	78,000	445,000
Average 5-year		138,000	

x-Disappearance of old tools other than by scrapping, stems from exports of used tools, accidental destruction, and absorption by industries outside the metal working group.

HOW OLD MACHINE TOOLS ARE



Source: American Machinist Inventories — 1925-45

TONNAGES of steel and of other metals available during 1946 would have been much larger if the year had not been punctuated by a series of strikes. The loss in steel alone mounted to 13,000,000 tons; and a substantial loss occurred in copper. These stoppages made shortages doubly severe. Since the strikes ended (and most of them were in the first quarter), metal supplies have steadily expanded. In recent months they have attained a volume believed to be close to future potential peaks. Slight gains, important to consumers, lie ahead. Price decontrol has freed a little more copper, lead, scrap steel and pig iron. No spectacular increases, however, are looked for. Sustained production in 1947 at rates promised by the industries involved will put into users' hands tonnages considerably bigger than in '46. This prediction obviously is on the assumption that there will not be a repetition of the crippling 1946 strikes.

Figures in the nonferrous consumption table are based upon copper deliveries to fabricators, domestic lead shipments and allocations from government stockpiles, total slab zinc consumption, and shipments of wrought aluminum and magnesium products.

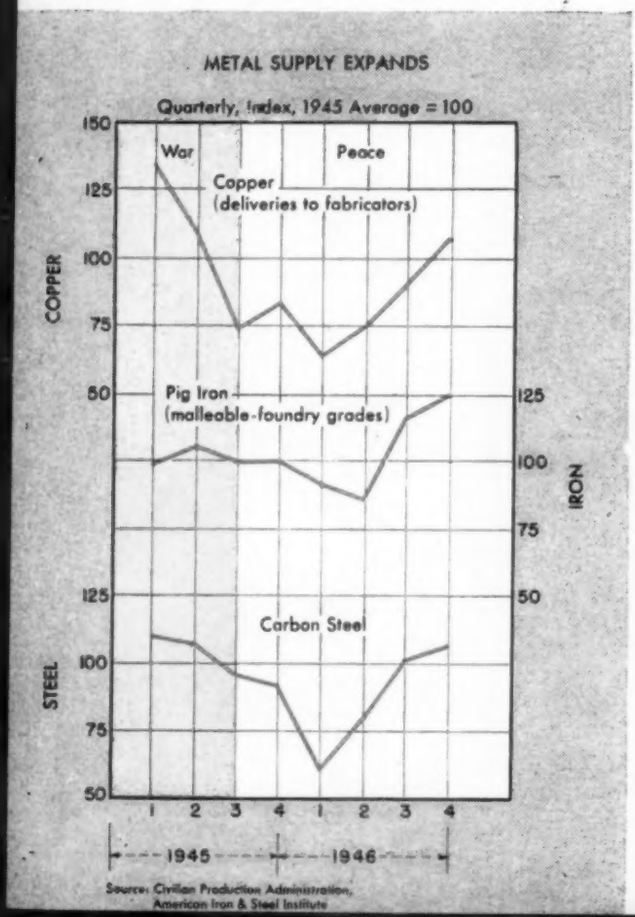
PIG IRON AND INGOT STEEL

(Production, thousands of tons)

YEAR	PIG IRON			STEEL		
	TOTAL	MERCHANT IRON	FOUNDRY AND* MALLEABLE GRADES	TOTAL	CARBON	ALLOY
1939	34,809	4,356	N.A.	52,799	49,587	3,212
1940	46,072	5,949	N.A.	66,983	62,017	4,966
1941	55,101	7,553	N.A.	82,839	74,633	8,206
1942	59,076	8,270	N.A.	86,032	74,506	11,526
1943	60,811	9,139	N.A.	88,837	75,687	13,150
1944	61,007	8,021	N.A.	89,642	79,009	10,633
1945						
Jan.	4,888	N.A.	380	7,204	6,296	908
Feb.	4,507	N.A.	372	6,653	5,790	862
March	5,162	N.A.	446	7,708	6,716	992
April	4,712	N.A.	423	7,292	6,374	918
May	4,932	N.A.	425	7,451	6,554	897
June	4,544	N.A.	419	6,842	6,049	793
July	4,734	N.A.	430	6,987	6,255	732
Aug.	4,181	N.A.	390	5,736	5,234	502
Sept.	4,171	N.A.	391	5,983	5,488	495
Oct.	3,343	N.A.	369	5,598	5,109	489
Nov.	3,982	N.A.	386	6,201	5,684	517
Dec.	4,287	N.A.	454	6,051	5,557	494
TOTAL	53,233[1]	N.A.	4,885	79,702[1]	71,105[1]	8,648[1]
1946						
Jan.	2,625	N.A.	386	3,872	3,545	327
Feb.	1,142	N.A.	306	1,393	1,262	130
March	4,384	N.A.	437	6,507	5,976	531
April	3,568	N.A.	392	5,860	5,332	528
May	2,244	390	268	4,072	3,679	394
June	3,637	445	374	5,625	5,081	543
July	4,650	592	473	6,610	6,007	603
Aug.	4,837	587	469	6,887	6,228	659
Sept.	4,626	599	475	6,508	5,933	585
Oct.	4,753	622	512	6,910	6,277	633
Nov.	.....	.....	....	6,410	5,825	584

[1] *Adjusted*

**Source: American Iron & Steel Institute, except data on foundry and malleable grades, from Civilian Production Administration, which are not comparable to A.I.S.I. data but follow the same trend.*



CONSUMPTION OF NONFERROUS METALS

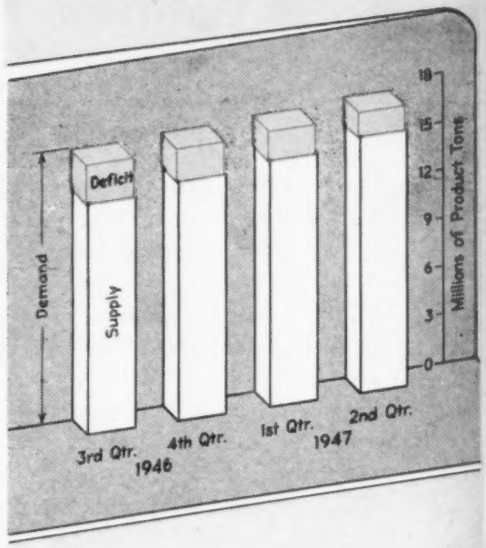
MONTH	COPPER (TONS)	LEAD (TONS)	SLAB ZINC (SHORT TONS)	ALUMINUM (THOUSANDS OF LBS.)	MAGNESIUM (THOUSANDS OF LBS.)
Jan. 1945	153,904	71,849	86,228	156,800	529
Feb.	165,387	67,920	79,676	153,800	571
Mar.	171,558	70,877	91,286	183,100	609
Apr.	147,209	67,704	84,488	182,000	554
May	131,670	64,337	84,678	186,400	737
June	117,492	64,368	70,812	155,400	583
July	79,739	56,007	58,799	141,200	506
Aug.	104,783	54,477	59,054	83,700	531
Sept.	83,363[1]	61,018	53,533	45,100	316
Oct.	108,048[2]	68,978	61,614	38,036	346
Nov.	100,400	69,692	59,355	46,214	353
Dec.	95,887	73,072	56,953	48,740	382
TOTAL	1,462,440	790,299	846,476		
Jan. 1946	100,213	67,076	57,391	57,213	427
Feb.	73,316	62,101	41,515	40,599	415
Mar.	73,225	44,620	61,446	72,756	466
Apr.	86,619	30,872	66,186	81,607	483
May	93,007	35,035	63,884	81,527	448
June	91,587	31,543	65,206	90,137	554
July	96,743	43,589	64,503	104,954	571
Aug.	119,644	43,120	73,536	114,794	507
Sept.	112,486	50,119		114,152	
Oct.	130,191	58,205		138,767	

[1] *After transfer to government stockpile*
[2] *Includes 110 tons exported*
Source: U. S. Department of the Interior, Bureau of Mines; War Production Board; American Bureau Metal Statistics and Office of Metals Reserve.

METALS—Demand

THE prolonged steel strike and two coal strikes during the past year took a heavy toll of steel output. These artificial brakes on production kept users from getting millions of tons of finished steel. OPA price restrictions also created critical situations in a number of steel items, situations which were just beginning to get straightened out as the year ran out. Steel demand during at least part of 1947 will continue to exceed supply. Some Washington estimators place the deficit the coming year at 15%, but many people close to the steel industry look for balance by midyear. McGraw-Hill economists place the shortage at 5-10% for the second quarter, somewhat lower than just recently. New mills, particularly in sheet and strip, will be coming in as 1947 progresses and will help alleviate the shortage, which will diminish as the months go by. Impact of the shortage will vary with each consuming industry by the types of steel used. The over-all picture is charted at right.

THE STEEL PICTURE:
TODAY AND TOMORROW



STEEL SHIPMENTS BY CONSUMING INDUSTRIES

(Net Tons)

INDUSTRY	1940	1941	1945	1946[1]
1. Steel Converting & Processing [3]				
(a) Wire Drawers & Manufacturers	503,694	535,741	575,091	434,116
(b) Bolt, Nut & Rivet Manufacturers	707,958	1,160,767	1,083,464	478,612
(c) Forging Manufacturers				
(1) Auto & Aircraft	168,863	385,561	494,781	203,478[2]
(2) All Other	405,711	758,881	1,291,568	332,495
(d) All Other Steel Plants & Foundries	1,142,616	1,956,853	2,131,096	1,920,501
TOTAL	2,928,842	4,797,803	5,504,000	3,369,202
2. Jobbers, Distributors	6,686,534	9,199,811	9,571,436	3,912,601
3. Construction	4,967,984	8,127,889	4,663,774	1,880,367
4. Shipbuilding	940,124	2,733,413	2,719,415	110,609
5. Pressing, Forming & Stamping				
(a) Metal Furniture & Office Equip.	470,373	676,944	206,711	102,582
(b) Hardware & Household Equip.	949,855	1,746,810	674,778	227,864
(c) Automotive	1,159,228	2,587,157	1,611,223	.....[3]
(d) All Other	739,487	1,310,625	1,226,618	248,590
TOTAL	3,318,943	6,321,536	3,719,330	579,036
6. Container Industry	2,985,338	4,489,410	4,332,692	1,893,141
7. Agricultural Equipment	919,502	1,153,678	1,120,320	429,472
8. Machinery, Tools & Electrical Equip.				
(a) Machinery & Tools	1,108,463	1,569,712	1,607,026	901,715
(1) General Industrial Equip.	N.A.	N.A.	N.A.	325,891
(2) Construction & Related Equip.	N.A.	N.A.	N.A.	157,899
(3) Metalworking Equip.	N.A.	N.A.	N.A.	70,897
(4) Tractors	N.A.	N.A.	N.A.	108,514
(5) Hand Tools	N.A.	N.A.	N.A.	87,615
(6) Other Special Indus. Equip.	N.A.	N.A.	N.A.	150,899
(b) Electrical Machinery & Equip.	776,945	1,301,275	818,631	470,412
(1) Power Generating & Distributing	N.A.	N.A.	N.A.	305,232
(2) Other Electrical Apparatus	N.A.	N.A.	N.A.	112,268
(3) Communication Equip. & Electronic Devices	N.A.	N.A.	N.A.	52,912
TOTAL	1,885,408	2,870,987	2,425,657	1,372,127
9. Automotive & Aircraft				
(a) Automotive, excluding tractors				
(1) Passenger cars	N.A.	N.A.	N.A.	818,299
(2) Trucks	N.A.	N.A.	N.A.	170,678
(3) Parts, Accessories, & Supplies	N.A.	N.A.	N.A.	1,141,237
(b) Aircraft	N.A.	N.A.	N.A.	10,326
TOTAL	6,074,117	6,392,202	2,464,158	2,140,540
10. Railroad Industry				
(a) Railroads	2,575,181	3,533,866	3,669,731	305,839
(b) Equipment & Parts Builders	1,202,196	2,146,935	1,451,466	1,161,409
TOTAL	3,777,377	5,680,801	5,121,197	1,467,248
11. Oil, Natural Gas & Mining	1,132,201	1,985,140	1,605,707	165,174
12. Ordnance, Projectiles & Tanks	.....[4]	1,413,246	5,508,761	21,998
13. Miscellaneous	2,135,581	1,429,500	4,692,450	3,518,745
14. Exports	8,098,874	5,888,746	3,793,343	1,139,200
GRAND TOTAL	45,850,825	62,484,162	57,242,240	21,999,460

[1] *First six months only* [2] *Auto only* [3] *Included in group 9* [4] *Included in miscellaneous*
Source: American Iron & Steel Institute

*COMPONENTS—Output

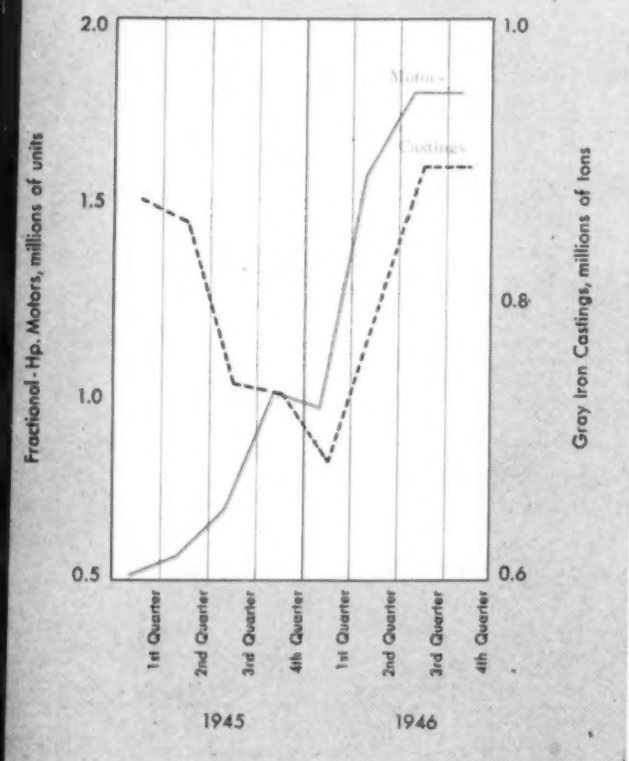
SHORTAGES of components of many kinds seriously hampered metal-working operations throughout 1946. All through the year, numerous products, from machine tools to air-conditioning equipment, suffered because completion of assemblies was delayed by lack of a single part or perhaps two parts. Castings and fractional-horsepower motors were major bottlenecks. Production of these two items is shown on this page. The volume of motor output has almost quadrupled since the end of the war. Castings have rebounded from a low level reached during the strikes early in 1946, and at the year's closing production was greater than on V-J Day. Despite impressive gains in operations, backlogs in fractional-horsepower motors and in castings continue large, even after allowance for duplicate orders.

SHIPMENTS OF CASTINGS
(Short Tons)

Month	STEEL	GRAY IRON	MALLEABLE IRON	COPPER AND COPPER-BASE ALLOY	ZINC	ALUMINUM
1945						
Jan.	210,212	861,524	78,788	52,250	.....	22,794
Feb.	191,361	816,467	75,220	49,650	.....	22,046
March	222,591	927,925	85,307	56,200	.....	25,137
April	197,737	842,979	76,065	50,850	.....	23,160
May	192,921	866,951	79,565	49,350	.....	21,662
June	173,685	849,449	71,992	43,500	.....	19,537
July	139,315	748,790	55,813	40,800	.....	15,565
Aug.	131,411	750,050	52,647	37,950	.....	11,422
Sept.	114,613	717,768	46,960	29,000	.....	7,903
Oct.	130,344	767,209	59,096	34,050	.....	9,912
Nov.	123,048	751,092	57,315	32,400	.....	9,480
Dec.	115,239	678,091	51,963	27,950	.....	8,885
TOTAL	1,942,477	9,578,295	790,731	503,950	.....	197,503
1946						
Jan.	99,058	706,319	53,685	36,446	8,354	11,784
Feb.	57,423	541,177	40,156	30,753	8,895	11,615
March	101,396	796,068	50,235	37,985	10,360	13,331
April	146,327	856,678	65,010	39,394	11,361	13,846
May	129,211	757,041	62,598	38,366	12,289	14,589
June	123,551	735,060	61,650	35,898	11,920	14,248
July	119,157	810,829	64,446	33,728	11,233	14,414
Aug.	130,450	944,516	68,603	39,346	13,203	16,923
Sept.	126,415	913,824	69,516	38,896	12,999	16,002
Oct.	.....	1,051,068	79,368	.....	.....	.....

Source: Department of Commerce, War Production Board, Steel Division, Civilian Production Administration

COMPONENTS OUTPUTS RISING



TYPICAL PARTS

YEAR	FRACTIONAL—HP. MOTORS (SHIPMENTS IN UNITS) UNDER 1/20th	1/20th—1.0	TOTAL	STEEL FORGINGS (SHIPMENTS IN TONS)	GEARS (SALES) (INDEX: 1928=100)
1939	429,037*	456,060*	885,097*	.....	103
1940	N.A.	N.A.	N.A.	.....	155
1941	N.A.	N.A.	N.A.	.....	269
1942	N.A.	N.A.	N.A.	.....	355
1943	N.A.	N.A.	N.A.	329,356*	336
1944	N.A.	N.A.	N.A.	348,854*	278
1945					
Jan.	190,056	326,687	516,743	497,862	323
Feb.	196,203	319,845	516,048	482,548	331
March	199,230	333,389	532,619	549,345	339
April	198,954	378,796	577,750	523,623	296
May	225,202	349,398	574,600	510,009	309
June	211,344	345,282	556,626	429,752	271
July	246,854	435,137	681,991	345,145	264
Aug.	249,833	453,865	703,698	227,417	205
Sept.	271,609	415,103	686,712	126,338	213
Oct.	363,058	525,846	888,904	145,365	251
Nov.	423,479	635,236	1,058,715	135,288	255
Dec.	432,230	646,904	1,079,134	119,407	239
1946					
Jan.	549,539	323,837	873,376	117,284	269
Feb.	559,360	290,582	849,942	84,166	253
March	586,835	577,046	1,163,881	122,609	275
April	821,616	686,811	1,508,427	155,237	284
May	816,548	837,196	1,653,744	138,599	313
June	828,690	781,766	1,610,256	146,612	321
July	833,661	847,681	1,681,342	153,839	407
Aug.	891,063	890,112	1,781,175	170,692	368
Sept.	905,202	1,002,730	1,907,932	162,022	342
Oct.	.....	.....	1,900,000 est.	189,280	...

*N.A. Not available est.-estimated * Monthly average*
Source: Civilian Production Administration; U. S. Department of Commerce; American Gear Manufacturers Association.

PRODUCTS

PRODUCTION of finished durable goods is clearly headed for higher ground. Nineteen forty-seven should set new records in many lines, despite the handicaps of materials and components shortages and despite possible labor upheavals. Output has been gaining, in fact, ever since the series of strikes early in '46. There has been no uniformity in this upward movement, however, as one can see from the accompanying data on this page. Most specific products have risen higher than 1941 rates; motor trucks comprise a notable example. By contrast, some items have lagged badly. Passenger cars are an obvious instance, with refrigerators and sewing machines in the same general class. Freight cars too have fallen far below earlier production expectations. The overall result is that at the year-end, production of finished goods was only slightly above 1941 averages.

AUTOS AND TRUCKS

	Pass. Cars	Trucks Civil	Trucks Military	TOTAL Cars & Trucks
Peak mo., Apr. '29	571,956	91,855		663,811
1929, mo. avg.	382,283	64,301		496,584
1939, mo. avg.	238,900	57,236	516	296,652
1940, mo. avg.	307,694	58,598	4,616	370,908
1941, mo. avg.	312,025	68,600	18,240	398,865
1942, mo. avg.	18,401	10,441	55,969	84,811
1943, mo. avg.	0	241	56,051	56,292
1944, mo. avg.	0	9,894	52,056	61,950
1945, Jan.	0	15,019	52,046	67,065
Feb.	0	14,032	50,181	64,213
Mar.	0	18,339	56,393	74,732
Apr.	0	18,980	48,299	67,279
May	0	22,315	48,643	70,958
June	0	23,131	43,214	66,345
July	359	21,394	33,169	54,922
Aug.	1,381	27,532	17,247	46,160
Sept.	580	30,106	1,466	32,152
Oct.	16,839	40,900	1,325	59,064
Nov.	34,612	53,103	531	88,246
Dec.	30,022	28,792	750	59,564
1946, Jan.	58,575	54,791	73	113,439
Feb.	47,965	28,594	98	76,657
Mar.	90,045	39,348	11	129,404
Apr.	150,206	81,280	2	231,488
May	152,948	74,650	0	227,598
June	142,313	58,739	0	201,052
July	220,321	93,458	0	313,779
Aug.	241,302	105,506	0	346,808
Sept.	239,410	92,014	0	331,424
Oct.	285,562	109,953	0	395,515
Nov.	260,609	100,237	0	360,846

Source: Automobile Mfrs. Assn.; Civilian Production Administration

CAPITAL GOODS

(Shipments, monthly averages)

	FARM MACH. (000 OMITTED)	CONST. MACH. (000 OMITTED)	RAILWAY CARS DOM. (UNITS)	RAILWAY CARS EXPORT (UNITS)	ELEC. INDUS. TRUCKS & TRACTORS (UNITS)	PUMPS HAND (000 OMITTED)	PUMPS WATER WINDMILL SYSTEMS (000 OMITTED)	ELEC. OVERHEAD CRANES (000 OMITTED)	FDRY. EQUIPT. ('37–'39=100) (ORDERS)	MOTORS & GENS. ('36=100) (ORDERS)
1939	$30,667		2,094	32	90	44	19	$326	114	99
1941	49,500		6,719	1,974	258	72	29	1,512	347	316
1945										
Jan–Mar.	59,572	N.A.	4,593	822	411	31	29	612	497	294
Apr–Jun.	57,750	N.A.	3,979	1,016	375	26	32	612	368	275
Jul–Sept.	48,649	$19,644	3,092	1,364	271	25	26	474	507	235
Oct–Dec.	55,269	22,225	2,957	352	227	24	36	675	474	307
1946										
Jan–Mar.	52,992	15,804	2,668	718	149	26	43	775	454	288
Apr–Jun.	54,566	18,722	3,783	124	253	26	45	958	590	418
Jul–Sept.	63,050	N.A.	4,197	530	261	24	58	N.A.	472	470
Oct–Dec.	68,700[1]	N.A.	3,536[2]	3,823[2]	N.A.	N.A.	N.A.	N.A.	469[1]	N.A.

[1] *October* [2] *October and November*

Source: Civilian Production Administration; Dept. of Commerce; National Electrical Mfrs. Assn.; Foundry Equipt. Mfrs. Assn.; Amer. Ry. Car Inst.; Electric Industrial Truck Assn.; Electric Overhead Crane Institute

SHIPMENTS OF CONSUMER DURABLE GOODS

(In Thousands of Units)

MONTH	MECHANICAL REFRIGERATORS	WASHING MACHINES	SEWING MACHINES	VACUUM CLEANERS	RADIOS	ELECTRIC IRONS	ELECTRIC RANGES	GAS RANGES	OIL BURNERS	MECHANICAL STOKERS (HOME)	WARM AIR FURNACES	WATER HEATERS
Mid-'40–'41 Mo. Avg.	309	158	67	156	1100	380*	47	163	27	14	N.A.	175
1946												
Jan.	123	171	14	120	550	282	25	148	29	15	38	191
Feb.	65	88	13	128	750	308	21	123	29	14	40	140
March	107	113	28	162	1000	382	23	145	33	16	47	168
April	143	177	28	174	1000	473	31	164	35	14	43	200
May	196	185	31	166	1200	430	31	151	33	14	47	225
June	210	194	27	180	1400	559	46	150	33	13	49	223
July	220	187	35	197	1300	521	57	138	41	15	49	230
Aug.	218	215	29	218	1700	664	66	161	'56	20	62	267
Sept.	233	212	35	240	1500	697	61	150	56	19	73	271
Oct.	280e	265e	45	266e	1800	750e	75	188	62e	22e	83	322

**1940 N.A. Not Available e-estimated*

Source: Civilian Production Administration; Department of Commerce, Bureau of Census

BACKLOGS BY INDUSTRY
33 ARE DOWN, 29 ARE UP

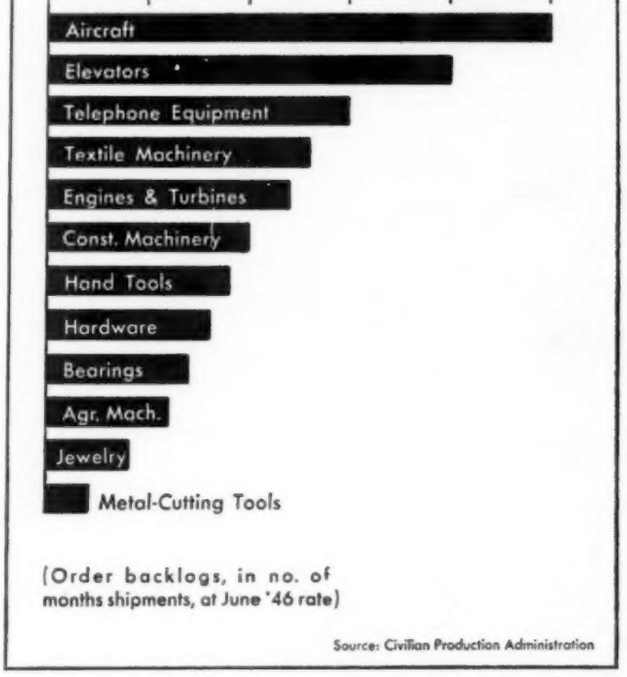
At June, 1946, shipment rate →	PERCENT CHANGE FROM 1944 AVERAGE	MONTHS TO FILL JUNE, 1946 ORDER BACKLOGS
Intermediate products	− 31	8
Metal tanks	− 2	10
Insulated wire and cable	+ 1	10
Bolts, nuts, washers, rivets and screws	− 34	5
Electric wiring devices and conduits	− 30	7
General-purpose industrial equipment	− 48	8
Anti-friction bearings	− 39	7
Plain bearings	− 57	6
Valves, faucets and fittings, n.e.c.	− 35	6
Mechanical power-transmission equipment	− 50	8
Blowers and fans	− 47	9
Power-driven pumps (except farm)	− 35	10
Engines and turbines (except aircraft)	− 79	12
Electric generating and distributing apparatus	− 45	15
Motors and generators	− 49	17
Power and distribution transformers	+ 27	23
Switch gear, circuit breakers, motor-control, etc.	− 39	10
Metalworking machinery and equipment	− 27	7
Machine tools	− 35	7
Metal-cutting tools (except hand)	− 37	2
Machine-tool attachments and fixtures	− 31	4
Presses, mechanical and hydraulic	+ 79	11
Rolling mills	− 4	13
Portable metalworking tools and machinery	− 30	11
Electric welding apparatus	+ 20	4
Agricultural machinery and equipment	+ 36	6
Tractors, wheel-type	− 11	7
Harvesting, haying machinery, etc.	+ 81	6
Construction and excavating machinery	− 38	10
Special-industry machinery	+ 52	11
Chemical manufacturing machinery	− 44	15
Plastic-working machinery	+388	7
Canning machinery	+106	9
Bakery machinery	+105	15
Foundry machinery and supplies (except furnaces)	− 12	5
Paper-mill and paper-products machinery	+288	23
Printing-trades machinery and equipment	+111	24
Textile machinery	+123	13
Woodworking, cooperage and wooden-box-making machinery	+ 36	13
Oil-field drilling machinery and equipment	+ 33	5
Mining equipment	+ 25	6
General-industry machinery and equipment	− 33	10
Cranes, hoists, winches and derricks	− 68	9
Conveying equipment	+ 33	9
Elevators and escalators	+ 26	20
Industrial trucks and tractors	− 44	8
Telephone and telegraph equipment	− 2	15
Other communication and electronic equipment	− 70	12
Aircraft, parts and equipment	n.a.	25
Ships and ship equipment	− 89	7
Locomotives and parts	− 26	10
Railroad cars and parts	+ 3	22
Refrigeration and air-conditioning equipment	+122	14
Laundry and dry-cleaning equipment, commercial	+187	8
Business machines	+122	10
Plumbing and heating equipment	+131	9
Safety and technical equipment	− 10	7
Containers and closures	+ 20	5
Hardware	+ 37	8
Hand tools	+ 1	9
Jewelry and related products	+111	3
Lighting fixtures and equipment	+128	8
Other metal products	+ 46	6

Source: Civilian Production Administration

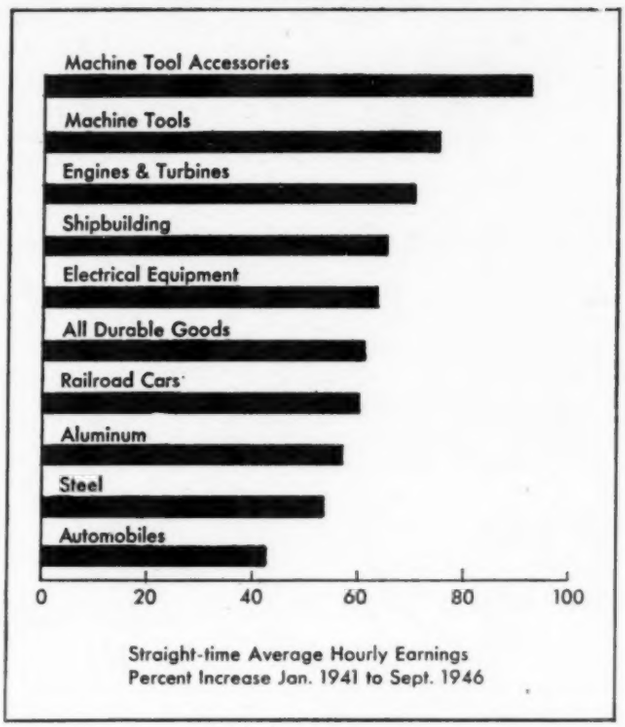
ORDER backlogs vary sharply among the metalworking industries. This is plain from a comparison of shipments and unfilled orders for June, 1946, which are last such statistics for specific industries that will be compiled by the Civilian Production Administration. Although they report conditions six months ago, the figures still give a good rough and ready index to the situation today. For backlogs have increased in most lines of Metalworking up to the second round of strikes: new orders ran ahead of shipments during the latter months of 1946.

You would expect longer backlogs among the industries that converted to war work and shorter ones among those which went on making regular products (even if for war use). That is generally the case. For example, things like air-conditioning equipment and printing machinery have scored big gains in shipments over restricted 1944 volumes, and unfilled orders are large. Conversely, metal-cutting tools and machine-tool parts have fallen off from wartime levels and have smaller backlogs.

Exceptions to the rule crop up, of course. Aircraft companies boast large backlogs because production takes so long; other lines show short orders because customarily they do not book for long-run delivery. Similar variations in business practices and other factors affect the figures, but by and large, they furnish crucial clues to the future strength of metalworking industries.



WAGE MOVEMENTS UNEVEN



• METALWORKING—Wages

CHANGES in wages have not been at all uniform, no matter how you look at them. Thus, from Jan., 1941, base date of the original wage-stabilization program, to September, 1946, last date for which figures are available, increases in straight-time hourly earnings range between 42% in autos to 92% in machine-tool parts. Since March, 1945, last of the great war-production months, the changes run more evenly on an hourly basis, but not in terms of weekly pay. Future wages—and prices—will have to be determined with the strikingly different experience of each individual industry in mind.

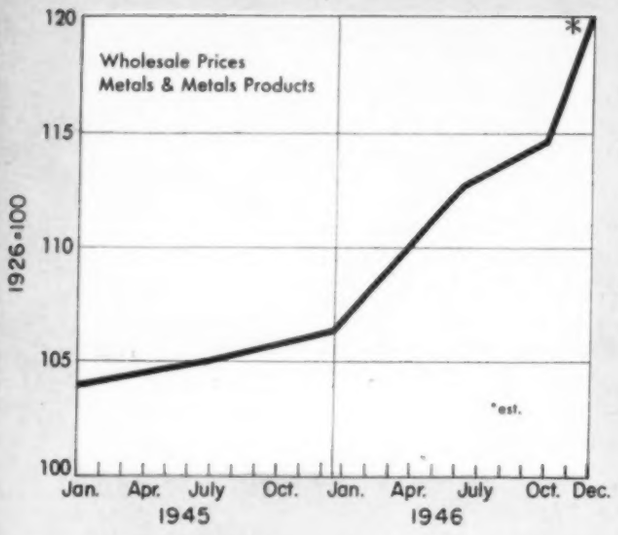
It is by no means certain that forthcoming wage changes will serve to even out the percentages by which earnings have changed since the last peacetime year; they may simply continue to run along the lopsided pattern that has developed over the past half-dozen years.

AVERAGE EARNINGS IN METALWORKING INDUSTRIES

INDUSTRY	AVERAGE WEEKLY EARNINGS			PERCENT INCREASE		AV. STRAIGHT-TIME HOURLY EARNINGS			PERCENT INCREASE	
	JAN. 1941	MAR. 1945	SEPT. 1946	JAN. '41-SEPT. '46	MAR. '45-SEPT. '46	JAN. 1941	MAR. 1945	SEPT. 1946	JAN. '41-SEPT. '46	MAR. '45-SEPT '46
ALL MANUFACTURING INDUSTRIES	$26 64	$47 51	$45.41	70%	− 5%	66 9¢	97 2¢	109.2¢	63%	12%
Durable Goods	30.48	53.38	48 39	59	− 9	72.5	104 9	116.5	61	11
Nondurable Goods	22.75	39 00	42.34	86	9	60 1	84.7	101.8	69	20
Blast furnaces, steel works, rolling mills	33.60	56.15	50.28	50	−11	85 2	110 2	130.4	53	18
Gray-iron and semi-steel castings	30.45	53.98	52 58	73	− 3	71.2	102.1	118.6	67	16
Malleable iron castings	28.42	52.72	51.50	81	− 2	68.6	99.8	122.5	79	23
Steel castings	32.27	53.84	49.28	53	− 9	75.0	105.6	126.4	69	20
Cast iron pipe and fittings	25.42	42.35	43.59	71	3	60.7	83.9	103 9	71	24
Tin cans and other tinware	25.31	41.67	46.22	83	11	62.3	85.0	106.3	71	25
Wirework	28.27	52.01	50.30	78	− 3	69.5	99.0	116.6	68	18
Cutlery and edge tools	25.90	44.92	45.83	77	2	63.2	90.5	101.0	60	12
Tools, exc. edge & machine tools, files, saws	29.49	47.35	47 59	61	*	61.9	91.9	106 7	72	16
Hardware	25.24	47.31	45.26	79	− 4	60.0	91.8	105.2	75	15
Plumbers supplies	27.13	49.97	45.63	68	− 9	68.2	98.9	113.2	66	14
Stoves, oil burners, etc.	26.07	48.78	47.36	82	− 3	66.5	96.7	114.4	72	18
Steam & water heating apparatus & fittings	30.98	49.32	49.72	60	1	69.7	96.0	117 9	69	23
Stamped & enameled ware, galvanizing	26.32	48.71	45.53	73	− 7	65.0	97.5	111.6	72	14
Fabricated structural & ornamental metalwork	31.01	51.88	48.71	57	− 6	71.2	103.5	116.7	64	13
Bolts, nuts, washers, rivets	29.58	52.26	45.67	54	−13	67.6	97.7	114.4	69	17
Forgings, iron & steel	36.75	61.62	53.52	46	−13	76.3	117.3	133.2	75	14
Firearms	35.09	59.96	53.30	52	−11	65.7	118.8	120.1	83	1
Electrical equipment	33.18	52.51	49.41	49	− 6	72.3	102.9	118.1	63	15
Radios and phonographs	24.08	43.04	43.11	79	*	62.1	86.6	104.0	67	20
Communication equipment	32.47	47.18	50.41	55	7	75.3	95.7	114.2	52	19
Machinery & machine products	34.00	55.03	51.08	50	− 7	73.3	102.8	119.4	63	16
Engines & turbines	36.50	60.85	55.26	51	− 9	77.7	112.8	132.3	70	17
Tractors	36.03	53.58	51.21	42	− 5	83.4	106.7	127.3	53	19
Agricultural equipment excl. tractors	29.92	54.68	51.09	71	− 7	74.0	105.5	123.0	66	17
Machine tools	40.15	60.49	54.31	35	−10	71.6	105.1	124.3	74	18
Machine-tool accessories	37.90	61.70	56.28	48	− 9	68.2	111.7	130.7	92	17
Textile machinery	30.13	51.03	49.43	64	− 3	63.4	92.7	110.5	74	19
Typewriters	26.40	49.56	47.19	79	− 5	66.1	91.7	108.6	64	18
Business machines excl. typewriters	34.78	59.38	52.80	52	−11	81.3	112.3	130.3	60	16
Locomotives	34.79	66.58	58.12	67	−13	77.3	112.0	143.4	86	28
Railroad cars	29.57	55.91	49.08	66	−12	75.4	110.4	120.4	60	9
Aircraft and parts, excl. engines	34.13	56.24	53.51	57	− 5	72.6	109.8	127.0	75	16
Aircraft engines	42.16	61.99	56.67	34	− 9	82.0	122.4	130.2	59	6
Ship building and boat building	37.69	64.63	51.70	37	−20	85.5	125.2	141.4	65	13
Automobiles	37.69	59.49	53.12	41	−11	95.0	118.1	134.8	42	14
Aluminum	32.85	51.20	47.10	43	− 8	74.8	99.0	116.9	56	18
Other nonferrous metals, smelting & refining	29.21	49.61	48.74	67	− 2	74.1	98.5	117.2	58	19
Other nonferrous metals, alloying, rolling, etc.	35.96	56.40	51.50	43	− 9	77.0	105.3	123.5	60	17
Clocks and watches	23.90	46.02	43.56	82	− 5	60 2	89.9	103.5	72	15
Jewelry	26.43	47.82	48.96	85	2	65.0	93.8	106.1	63	13
Silverware and plated ware	27.37	49.53	55.60	103	12	64.0	95.6	112.4	76	18
Lighting equipment	28.19	47 73	46.18	64	− 3	70 1	98.1	115.2	64	17

Minus sign denotes decrease
Less than 1.0%

CLIMBING FAST



Source: Bureau of Labor Statistics

•METALWORKING-Prices

ALL available prices point upward. But one should realize that price data for most metal products are hard to get, hence the accompanying chart is merely indicative of the general price trend. It is interesting and useful to compare various commodities for which prices are fairly representative to obtain a rough idea of the different trends. Bear in mind that it is hard to get data for most metal products like machinery. Certain figures cannot be kept up continuously; the shutdown of automobile production during the war is an example. Even in the case of prices for which statistics are continuously available, it is difficult to maintain them on a truly comparable basis in the face of changes in pricing methods. Steel is an instance, with its base quotations, extras, and the rest.

PRICE INDEXES ON TYPICAL PRODUCTS

		FARM MACHINERY	MOTOR VEHICLES	PLUMBING & HEATING	IRON & STEEL	NONFERROUS METALS
1939		93.4	93.4	79.2	95.8	78.0
1941		93.5	103.3	84.8	96.4	84.4
Jan.	1945	97.5	112.8	92.4	97.7	85.9
Feb.		97.5	112.8	92.4	98.0	85.9
Mar.		97.5	112.8	92.4	98.1	85.9
Apr.		97.5	112.8	92.4	98.1	85.9
May		97.5	112.8	92.4	98.4	85.9
Jun.		97.5	112.8	92.6	99.1	85.9
Jul.		97.7	112.8	92.6	99.1	85.9
Aug.		97.8	112.8	93.4	99.1	85.8
Sep.		97.9	112.8	95.0	99.6	85.7
Oct.		97.9	112.8	95.0	99.8	85.7
Nov.		98.1	112.8	95.0	100.2	85.8
Dec.		98.1	112.8	95.0	101.0	85.8
Jan.	'46	98.1	112.8	95.0	101.2	85.7
Feb.		98.1	112.8	95.1	103.3	85.7
Mar.		98.5	112.8	95.1	107.0	86.1
Apr.		98.6	112.8	100.8	107.4	87.1
May		101.7	112.8	100.8	107.8	89.0
Jun.		107.0	112.8	106.0	110.1	99.2
Jul.		107.2	112.8	106.0	113.3	102.7
Aug.		108.5	112.8	106.3	113.3	101.4
Sep.		108.6	112.8	107.2	113.5	101.4
Oct.		108.7	143.3	107.2	113.7	101.8
Nov.		108.8p	148.4p	107.2p	113.9p	117.0p
% Change Nov. '46 From 1941		+16.4	+43.7	+26.4	+18.2	+38.6

• *April, 1942 Price carried until October* (1926 = 100) *Source: Bureau of Labor Statistics*

QUOTATIONS ON COMMON METALS

		BASIC PIG IRON	STEEL SCRAP	FINISHED STEEL COMPOSITE	STEEL SHEET	COPPER	LEAD	ZINC	BRASS SHEETS
		$ per ton	$ per ton	$ per ton	¢ per lb.	¢ per lb.	¢ per lb.	¢ per lb.	¢ per lb.
1939		21.08	16.39	56.76	3.10	11.171	5.05	5.11	17.6
1941		23.50	19.48	56.73	3.050	12.022	5.79	7.47	19.5
Jan.	1945	23.50	19.17	57.55	3.050	12.000	6.50	8.25	19.5
Feb.		24.00	19.17	57.55	3.050	12.000	6.50	8.25	19.5
Mar.		24.50	19.17	57.55	3.050	12.000	6.50	8.25	19.5
Apr.		24.50	19.17	57.55	3.050	12.000	6.50	8.25	19.5
May		24.50	19.02	57.82	3.050	12.000	6.50	8.25	19.5
Jun.		24.50	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Jul.		24.50	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Aug.		24.50	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Sep.		24.50	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Oct.		24.80	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Nov.		25.25	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Dec.		25.25	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Jan.	1946	25.25	19.17	58.27	3.050	12.000	6.50	8.25	19.5
Feb.		25.25	19.17	60.53	3.122	12.000	6.50	8.25	19.5
Mar.		25.63	19.17	63.54	3.275	12.000	6.50	8.25	19.5
Apr.		26.00	19.17	63.54	3.275	12.000	6.50	8.25	20.8
May		26.00	19.17	63.54	3.275	12.000	6.50	8.25	22.1
Jun.		28.00	19.17	64.21	3.275	14.222	8.18	8.25	23.7
Jul.		28.00	19.17	64.45	3.275	14.375	9.25	9.23	23.7
Aug.		28.00	19.17	64.45	3.275	14.375	8.25	8.25	23.7
Sep.		28.00	19.17	64.45	3.275	14.375	8.25	8.25	23.7
Oct.		28.00	19.17	64.45	3.275	14.375	8.25	8.865	23.7
Nov.		28.00	23.83	64.45	3.275	17.119	10.44	10.12	25.9
Dec.*		30.00	25.00	64.73	3.350†	19.500	12.55	10.50	27.5

**Midmonth* †*Estimated by A.M. following change in pricing method*
Source: Bureau of Labor Statistics, IRON AGE, STEEL, ENGINEERING & MINING JOURNAL

American Machinist

34th Annual Review

OF

Metalworking Equipment

PARTS AND MATERIALS

A concise, classified review of more than a thousand new products of interest to the metalworking industries. These products, introduced during the past year, are ready now to help meet production problems of 1947

CLASSIFIED INDEX OF EQUIPMENT

MACHINE TOOLS AND ATTACHMENTS

Turning 118
Boring 124
Planing 127
Drilling 128
Tapping and Threading..... 131
Broaching 133
Milling 134
Grinding, Honing and Lapping..... 139
Gear Cutting and Finishing..... 146
Cut-Off and Filing..... 147
Miscellaneous 148

TOOLS AND ACCESSORIES

Workholders 150
Toolholders 153
Stock Feeds 155
Cutters 155
Grinding Wheels and Dressers..... 159
Taps and Dies..... 160
Punches and Dies..... 161
Portable Power Tools..... 162
Hand Tools 163
Marking Equipment 163
Lubricating Equipment and Coolants.. 164

FORMING, CASTING AND MOLDING

Mechanical Presses 166
Hydraulic Presses 168
Brakes and Shears..... 171
Die Casters..... 171
Plastic Molders 172

WELDING AND HEAT-TREATING

Gas Welding and Cutting..... 174
Electric Welding 175
Welding Accessories 178
Furnaces and Heaters..... 180
Temperature Control 183

LAYOUT AND INSPECTION

Testing Machines and Gages..... 184
Comparators and Layout Equipment.. 188

CLEANING AND FINISHING

Polishing 192
Cleaning 192
Finishing 193

PLANT SERVICE EQUIPMENT

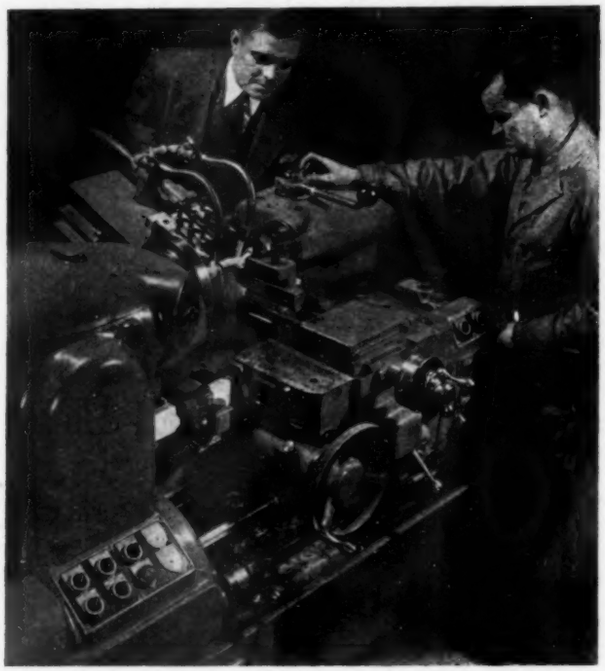
Industrial Trucks 195
Conveyors 198
Misc. Materials Handling..... 200
Pumps 201
Air Compressors, Cleaners..... 202
Drafting and Blueprinting..... 203
Miscellaneous 203

PARTS AND MATERIALS

Electrical 204
Mechanical 207
Hydraulic 208
Pneumatic 210
Fastening Devices 211
Materials 212
Processes 212

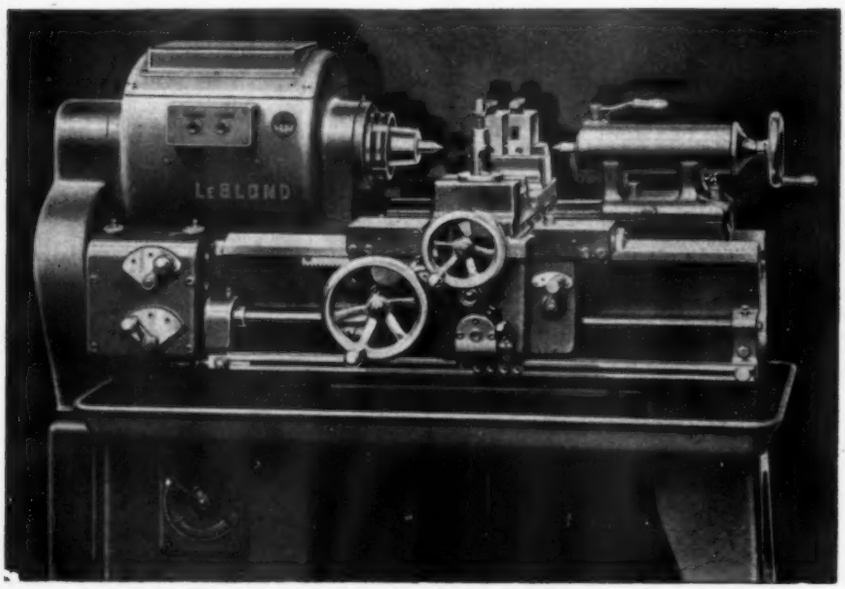
Machine Tools and Attachments

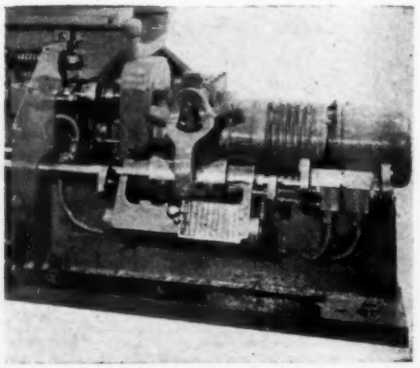
HAND SCREW MACHINE—*Monarch Machine Tool Co., Sidney, Ohio.* A high-production hand screw machine, the Speed-Matic, with power-feed ram turret, hand-operated cut-off slide, and pre-selected changeable spindle speeds (from 50 to 5000 rpm.), is designed to handle small turning work in quantities of 25 or more pieces with quick setups. Twelve feeds range from 0.0005 to 0.016 in. per rev. obtained by shifting two levers.



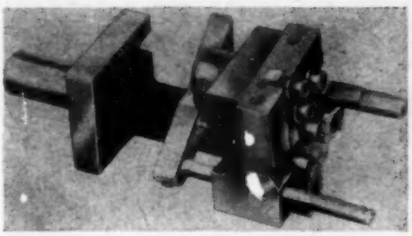
LATHE—*R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* 13-in. Motor-Head Rapid Production lathe is designed for light cutting at extremely high speeds. The two essential elements of an electric motor—stator and rotor—are built integral with the headstock. This motor-head operates at 5 hp. at top speed, and is said to run quietly as high as 3600 rpm. Attachments used on the standard 13-in. lathe are available. ↓

LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* Mona-Matic lathe is designed as a manual or semi-automatic machine for doing first- and second-operation work on gear blanks, straight and flanged bushings and various types of shafts with one or more steps. The front carriage can be equipped with either hand return of longitudinal and transverse movement of power-driven feed, or a semi-automatic cycle.



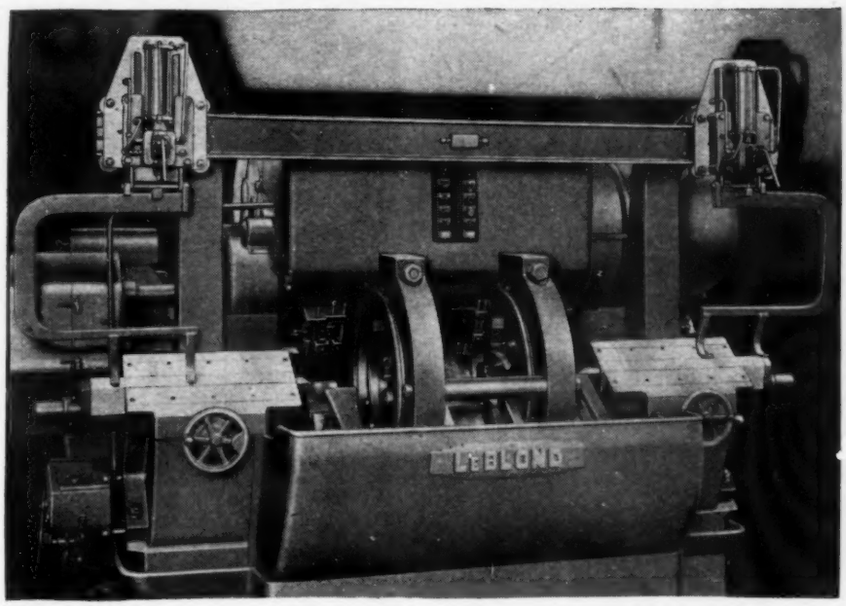


FEED REGULATOR—*Lehmann Machine Co., 3560 Chouteau Ave., St. Louis, Mo.* A new feature on Lehmann Hydratrol lathes is the automatic turret feed regulator with automatically positioned longitudinal and cross-feed stops. When the turret is indexed, front and rear crossslide positioning stops are indexed, longitudinal stops are indexed and the rate of feed is automatically regulated.



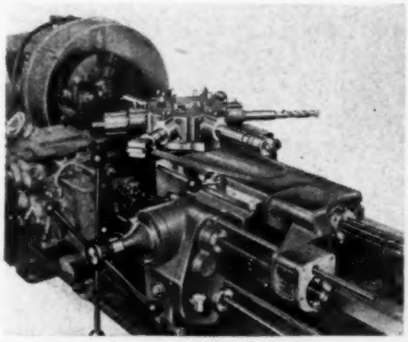
TURNING BOX—*Manufactured by Manchester Repetition Engineers Ltd., distributed by Accreylon Co., 130 W. 42nd St., New York 18, N. Y.* A unit for profile turning on lathes, M.R.E. Profile Turning Box, can be used for turning multi-diameters, contours, tapers, and other profiles at one pass of the box. A square face can be left on the work when increasing diameters, but a radius is formed on decreasing diameters.

LATHE—*R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* Dual Drive is built with a gear drive and a direct belt drive to fill the gap between Regal and heavy-duty models. The new lathe swings 15 in. over the bed ways and can be built with center distances starting at 30 in. 12 speeds are available, 8 in the low-speed range and 4 in the high-speed range for use with carbide tools.

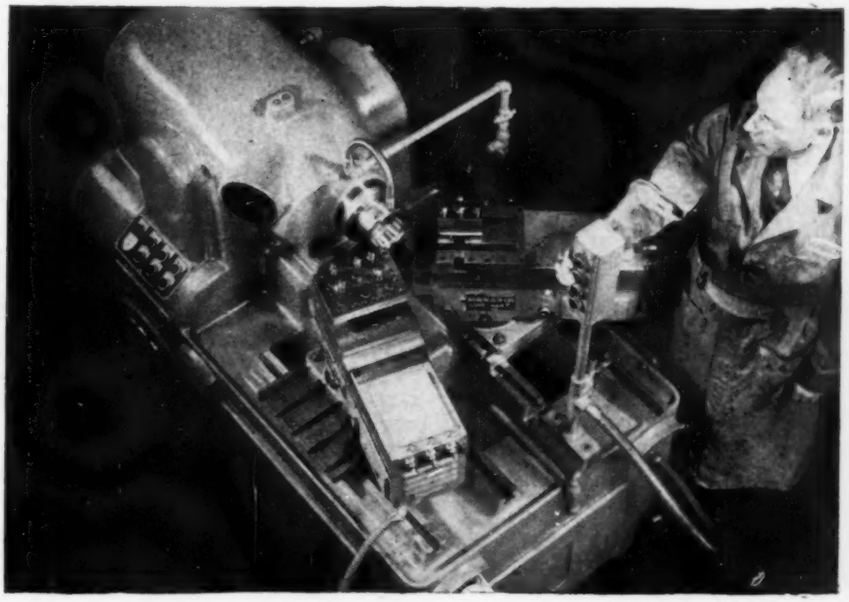


CRANKSHAFT LATHES—*R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* Four machines that are said to be more automatic and much faster than the models produced by LeBlond before the war. Included in the new line are 6AC for rough or finish turning all pin bearings, the 7ACL for rough turning all line bearings, the 1LB for rough and finish turning of line bearings, and the DM for finish turning of line bearings.

TURNING MACHINE—*Monarch Machine Tool Co., Sidney, Ohio.* A turning machine, the Uni-Matic, performs turning, facing, and boring operations. The machine consists essentially of a simplified version of the conventional lathe base and headstock, with change gears, motor and associated drive mechanism, and from one to three individual toolslides on swiveling bases.

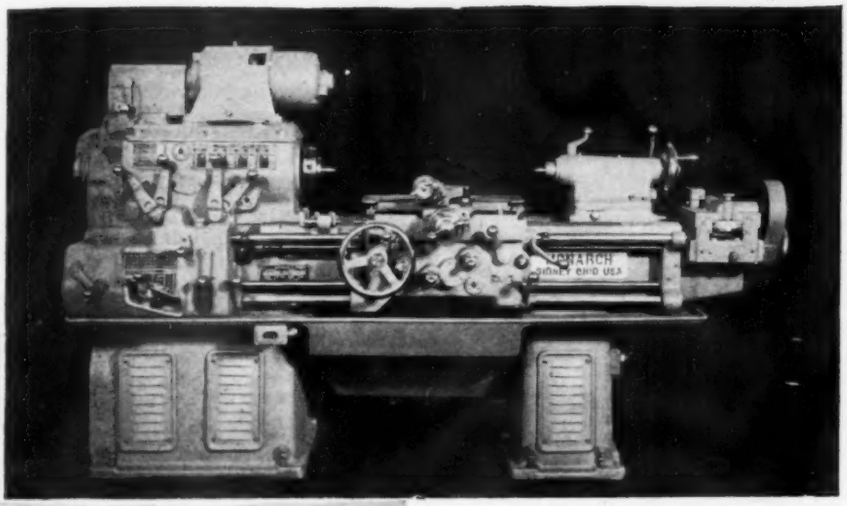


RAM-TYPE TURRET—*Axelson Mfg. Co., Box 98, Vernon Station, Los Angeles, Calif.* Of heavy duty design, the turret will handle any work within the capacity of the 20-in. lathe. It is available with either hand or power feeds. The six-station turret rotates on tapered roller bearings and is automatically indexed and clamped.

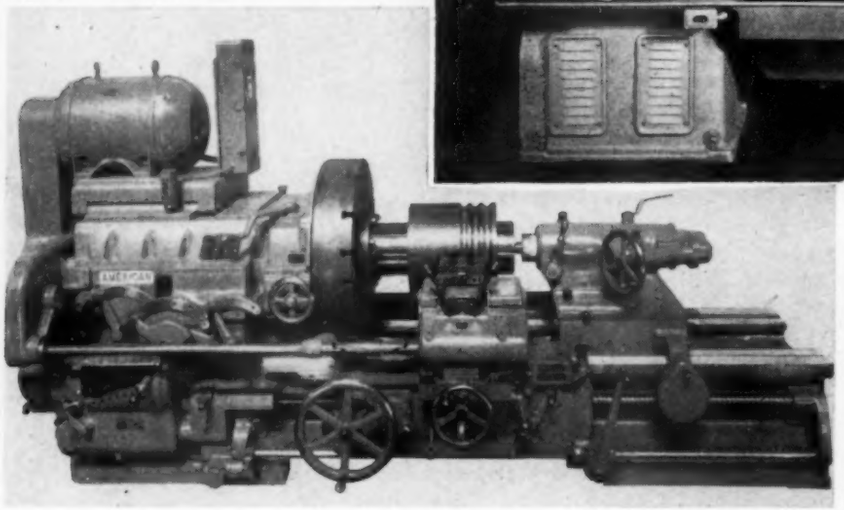


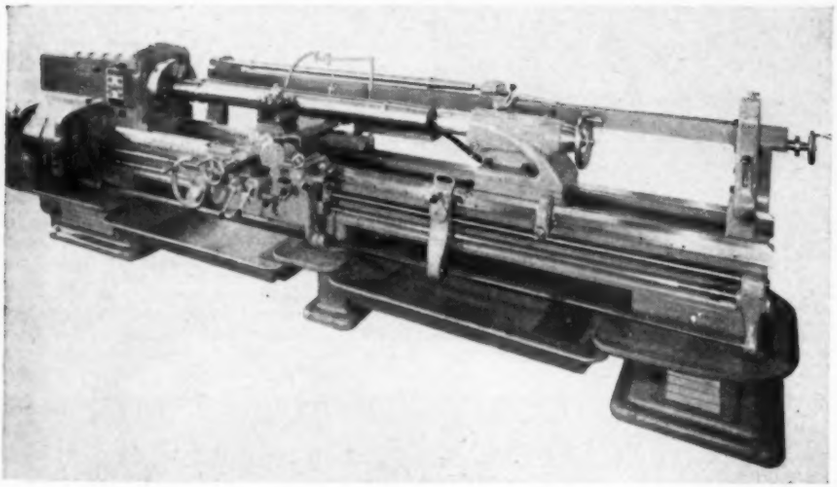
MACHINE TOOLS—Turning

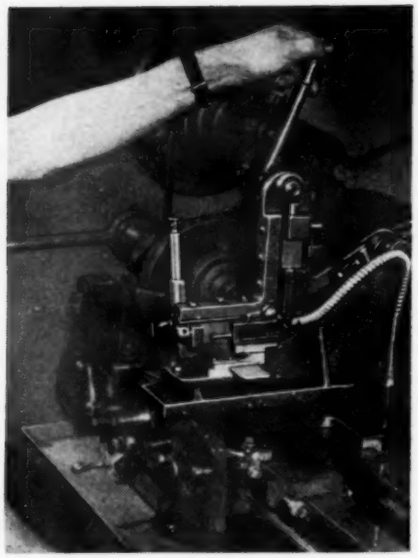
TOOLMAKER'S LATHE—*The Monarch Machine Tool Co., Sidney, Ohio.* This mold-makers' toolroom lathe swings 14½ in. over the bed, with a distance between centers of either 30 or 54 in. An adjustable-leadscrew variating-mechanism is included.



LATHE—*American Tool Works Co., Pearl St., at Eggleston Ave., Cincinnati 2, Ohio.* Irregular grooves are turned and formed in forging rolls on a 42-in. Super-Productive lathe equipped with an especially designed tool rest with cam-actuated tools for simultaneously varying the width and depth of the grooves.

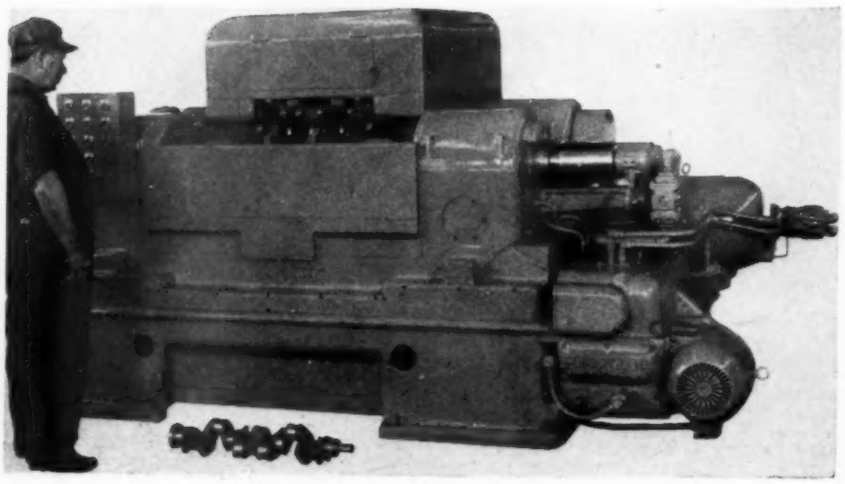






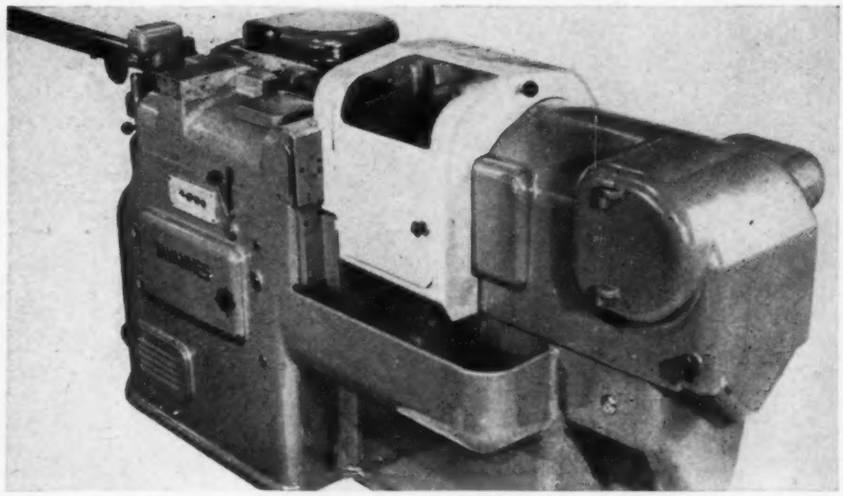
LATHE ATTACHMENT—*Oxford Engineering, Inc., Oxford, Mich.* Swiss-type converter can be used with any standard lathe. Tooling is by simple cams. The attachment can be removed when not in use. Parts from needle point to ½-in. diameter and from ¾ in. to 6 ft in length can be produced.

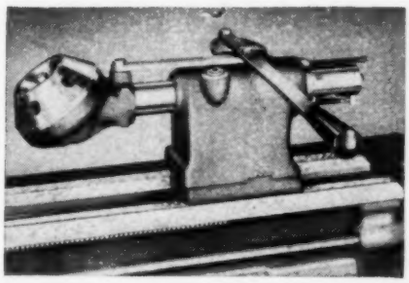
DUPLICATING LATHE—*American Tool Works Co., Cincinnati 2, Ohio.* Hydraulic duplicating lathe is a combination of the Pacemaker lathe and a special built-in Turchan hydraulic duplicator. The lathe will reproduce from a templet mounted at the rear of the lathe any shaft having an irregular contour. The toolslide operates at a 45° angle to the work axis which compensates for the longitudinal movement of the carriage and permits reproduction of square shoulders as well as radii and bevels.



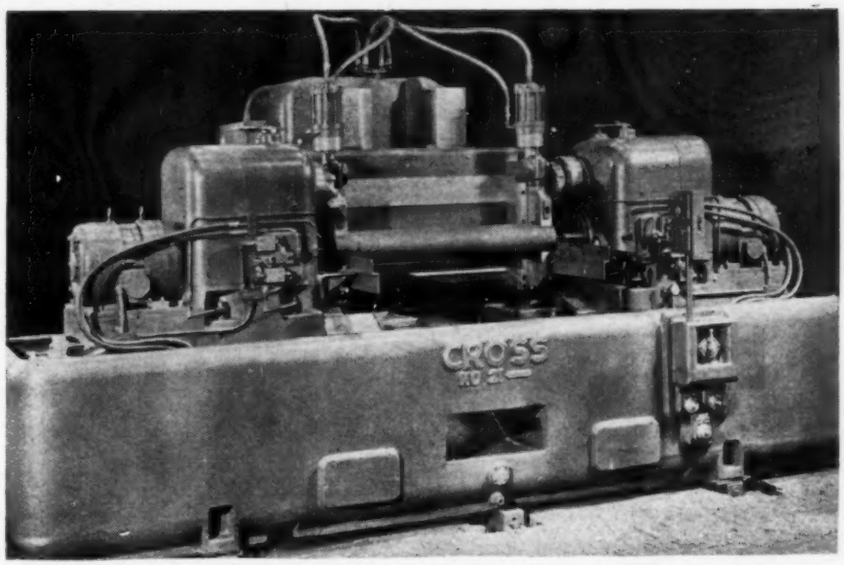
CRANKPIN TURNING MACHINE—*Wickes Bros., Saginaw, Mich.* Model MP-4 single-spindle machine for turning all crank pins on multiple-throw crankshafts can be used for either cheeking and rough turning or finish turning, spacing, and filleting. Tool feed is hydraulic and the lathe is completely automatic through each cycle.

SINGLE-SPINDLE AUTOMATIC—*Tavannes, marketed by Commentry Industries, Inc., 260 W. Broadway, New York 13, N. Y.* Available working positions are divided into six stations for side slide operations, and six turret positions. M-40 handles bars up to 1⅝-in. diameter, and M-60 handles bars up to 2⅜-in. Maximum turning length is 7⅛ in. with standard tooling, and 9 in. with a special tooling arrangement.





LATHE TURRET—*South Bend Lathe Works, 378 East Madison St., South Bend 22, Ind.* The handlever turret designed for use on 9-in. lathes handles six tools with ⅝-in. dia. shanks. The turret mounts in place of the tailstock. The turret slide has a maximum stroke of 3¼ in.

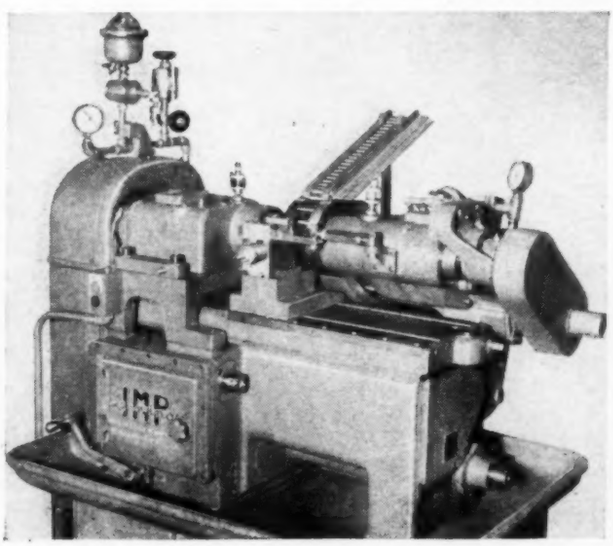


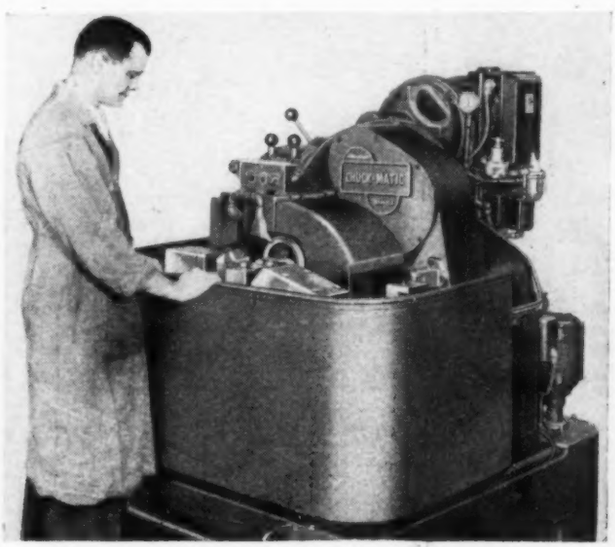
SHAFT-FACING AND CENTERING—*The Cross Co., Detroit 7, Mich.* A machine for facing and centering shafts in sizes from 1¼- to 6-in. diameters and 9- to 49-in. lengths. Operates in a full-automatic cycle with push-button control. Fifty average shafts are faced and centered in one hour.

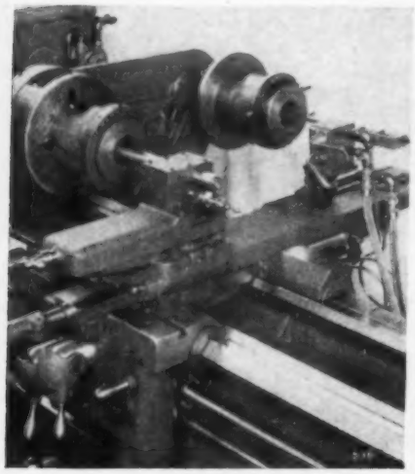
PENDANT CONTROL—*The Bullard Co., Bridgeport 2, Conn.* Pendant control for Cut Master vertical turret lathes are located at a convenient operating height and may be swung to any desired position. When a speed change is desired, the switch lever is thrown into brake position, the change of speed dialed and the lever thrown back into clutch position. Gears are shifted through electrically controlled, hydraulically operated mechanisms.

AUTOMATIC LATHE—*Seneca Falls Machine Co., Seneca Falls, N. Y.* Valve guides and similar parts are automatically turned in double-end drive automatic IMP lathe. Drive to both spindles is by pulleys and V-belts from a splined jackshaft. Parts may be rough and finish turned in the same operation with separate tools.

CHUCKING MACHINE—*The National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.* A single-spindle machine, the 12-in. Chuck-Matic, will handle production machining operations on castings, forgings, and tubing parts up to 12 in. in diameter. A single air-operated chuck holds the work. Cutting tools are mounted on two slides.

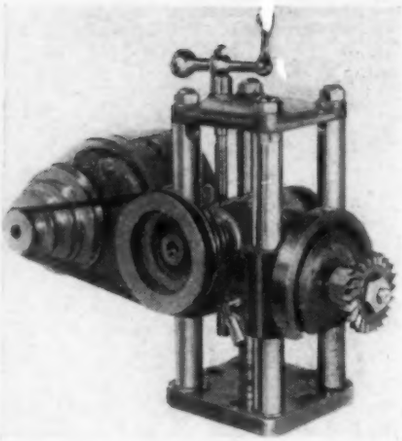




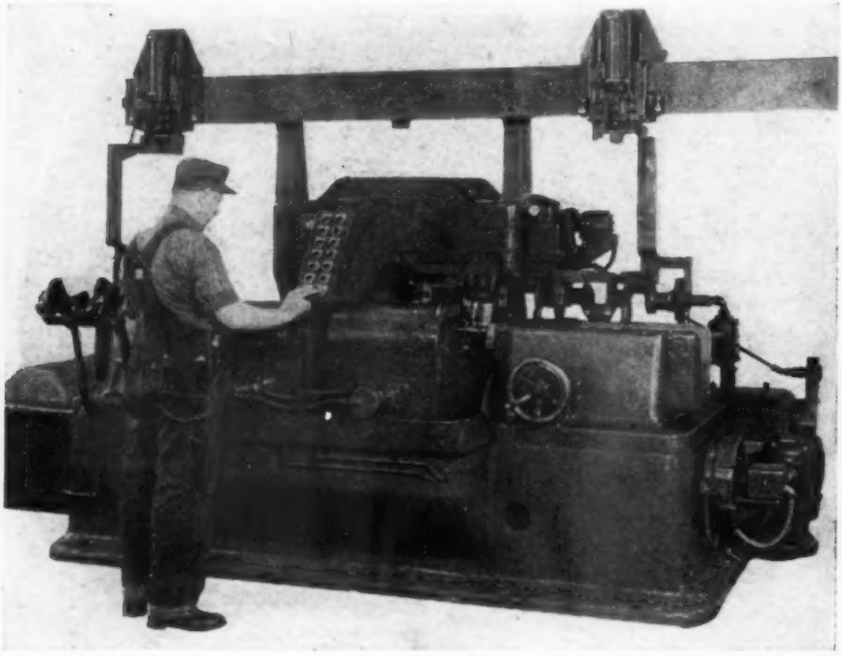


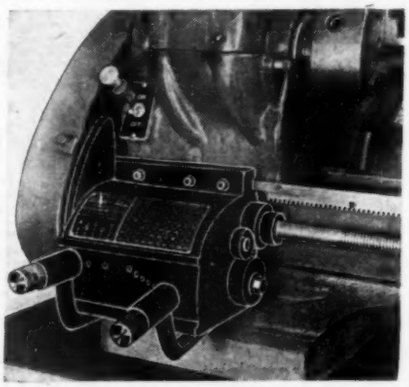
PROFILING ATTACHMENT—*Springfield Machine Tool Co., Springfield, Ohio.* A hydraulic profiling and duplicating machine is said to duplicate any job from bottle molds to complicated cam forms, interior or exterior. Any type of templet may be used—a round type rotated between centers at the rear of the machine, a flat one held stationary between centers, or a formed flat one mounted directly on one of the brackets.

SECOND-OPERATION MACHINE—*Hardinge Bros., Inc., Elmira, N. Y.* Model DSM 59 high-speed precision second-operation machine has steel bedways of dovetail design. These ways form a solid steel bed top which protects the accurate angular way surfaces. The spindle is ground to take 1-in. capacity 5C Hardinge collets and 6-in. capacity step chucks. The toolposts take standard ⅝-in. square toolbits.



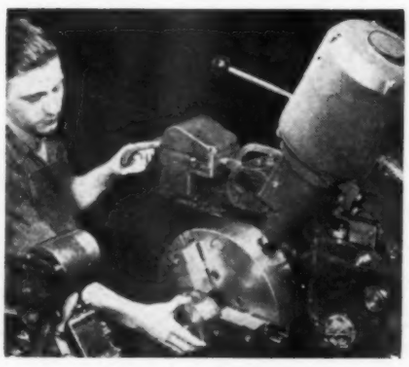
LATHE ATTACHMENT — *Master Manufacturing Co., Hutchinson, Kan.* The Master Lathe Converter is supplied with interchangeable heads to do external and internal grinding, angular milling to cut threads, worms, and screws, a broach attachment to cut internal keyways and internal splines; and a dividing head, which is mounted on the open end of the lathe spindle, for gear and spline cutting and grinding.

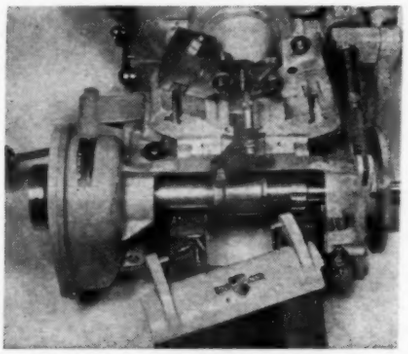




GEAR-BOX ATTACHMENT — *Western Aircraft Tool Co., Dept. AE, 650 N. Hoover St., Los Angeles 4, Calif.* A gear box attachment for Atlas, Craftsman, Logan, Powercraft, Clausing, and Moody lathes is said to cut accurate threads from 4 to 224 per inch, with approximately 0.003 in. feed for fine turning.

CRANKSHAFT LATHE — *Wickes Brothers, Saginaw, Mich.* Model CH-4 automatic rough- and finish-turning center-drive crankshaft lathe is equipped with hydraulic feed and is completely automatic. Rough-turning is done with divided tools both front and rear, then the finishing tools shift into position front and rear. A power-operated loading and unloading device is provided.

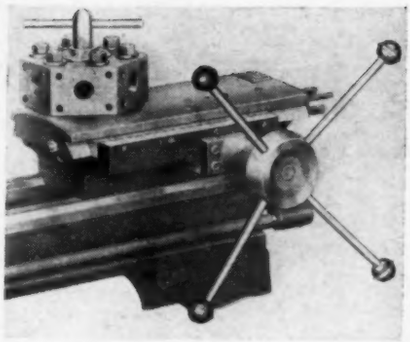




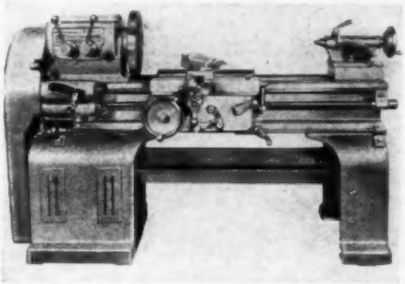
LATHE ATTACHMENT—*Dunn Engineering Co., 6341 Lyndon Ave., Detroit 21, Mich.* Lathe attachment gives means of producing small parts automatically on Atlas or Logan Lathes. The Dunamatic attachment employs the use of face cams to control operation of rocker arms which, in turn, control the operation of form and cut-off tools attached to them.

→

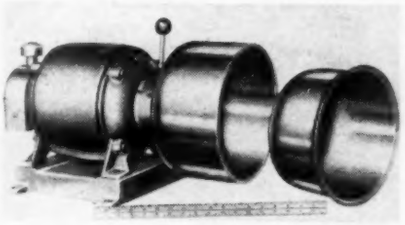
POWER WRENCH—*Fen Machine Co., 1301 Babbitt Rd., Cleveland, Ohio.* Consists of an electric motor driving a wrench head adjusted to the particular chuck being used. The control regulates tension of the work, giving a light or heavy chucking as required.



BED TURRET—*Enco Mfg. Co., Chicago, Ill.* Hexturret uses double steel drive gears and double racks for equalizing the feed of the tool on the work. Double gibs of heavy-duty type are employed to maintain accuracy. Used on lathes up to 14-in. swing.



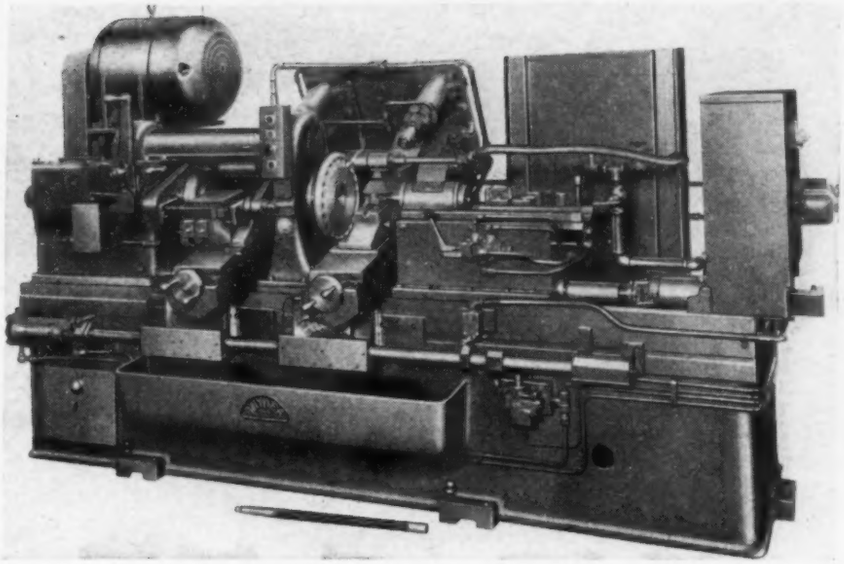
LATHE—*Sebastian Lathe Co., Box 1017, Cincinnati 1, Ohio.* A series of geared-head lathes, Type R, in 12, 14, 16, 18, and 20 in. sizes has eight speeds selected by controls marked in rpm. readings. Thread range is 3 to 384. Speed range in the 12 in. machine is 0.00175 to 0.222 and in the larger machines 0.002 to 0.252.



LATHE—*Crozier Machine Tool Co., 654 N. Prairie Ave., Hawthorne, Calif.* Lathe has a built-in wet vacuum pump which holds work pieces without chuck or collet. The vacuum holds the work securely when the lathe is in motion, and releases it when the machine is stopped. A vacuum seal is created by drawing oil from a large reservoir into the pump early in the vacuum cycle. The lathe will hold metal, plastic, rubber, wood, or glass.

→

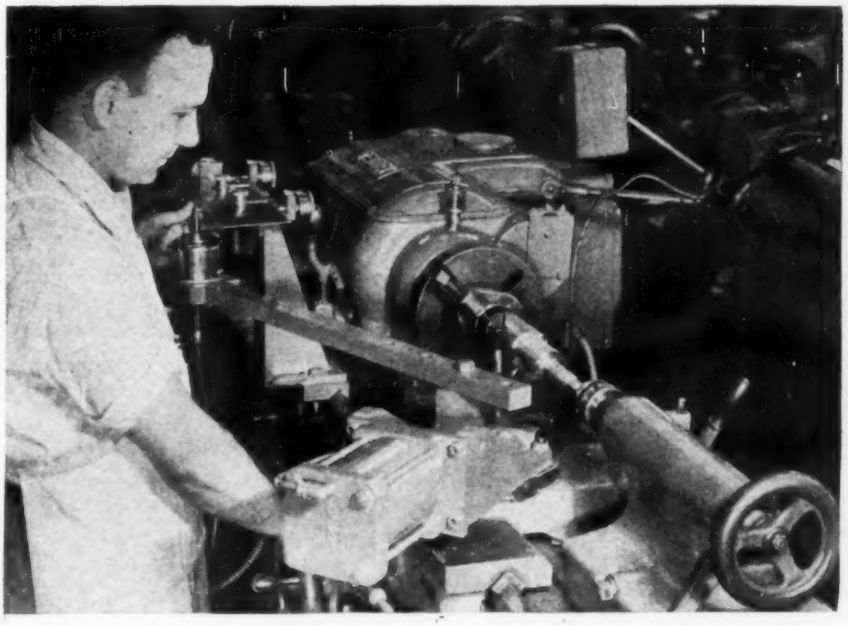
CHUCKING MACHINE—*Potter & Johnston Machine Co., Pawtucket, R. I.* Improvements in the Model 6DREL automatic chucking and turning machine have increased productivity and improved flexibility to the point of constituting a new model. Fully automatic after manual chucking of the work. Changes of speed and feed and the knock-off when work is completed are automatically performed.

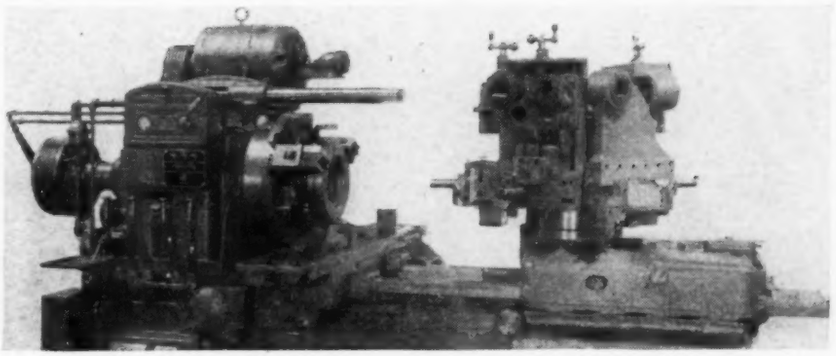


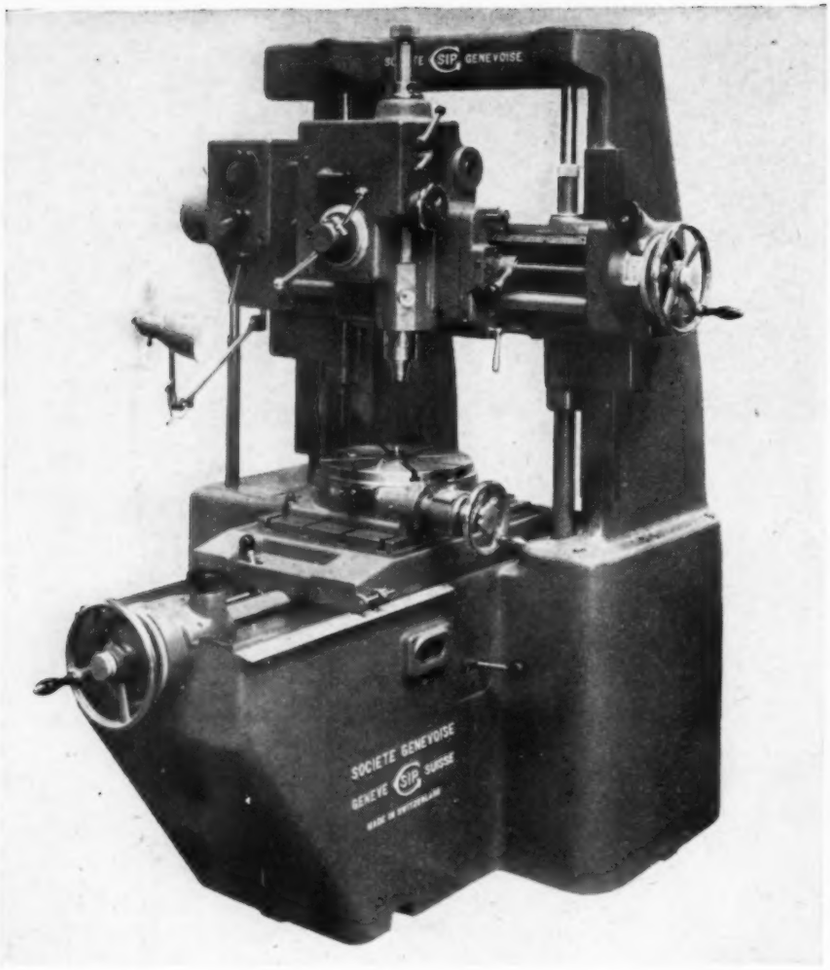
SHAFT-TURNING MACHINE—*Snyder Tool and Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* A special center drive, double-end turning machine with front and rear tool slide for turning shafts. The front tool slides are for turning the various diameters and forming a taper on one end, while the rear tool slides are for facing, chamfering, or undercutting.

DUPLICATING ATTACHMENT — *Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.* A combined air and hydraulic system which may be attached to engine lathes, turret lathes, or vertical boring mills to produce work with contours which correspond to a thin metal templet or master part. Single cylinder controls longitudinal and transverse motion.

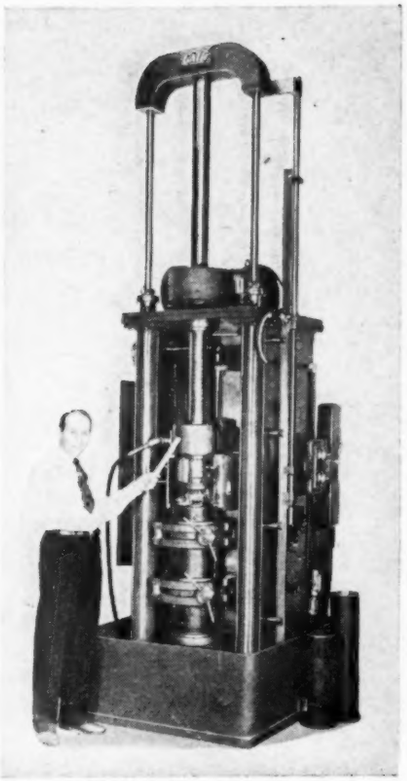
↓



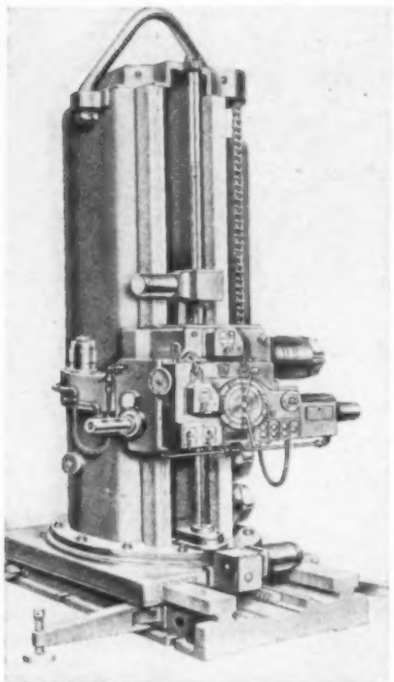




JIG BORER—*Cosa Corporation, 405 Lexington Ave., New York, N. Y.* SIP jig borer of the planer type, Type 3K, has a table working surface 20½ x 15 in. Measuring screws and micrometer heads are built in so that direct readings are made to 0.00005 in. on the verniers of large divided drums. Eight spindle speeds range from 75 to 2,000 rpm., and six automatic feeds in either direction are available.

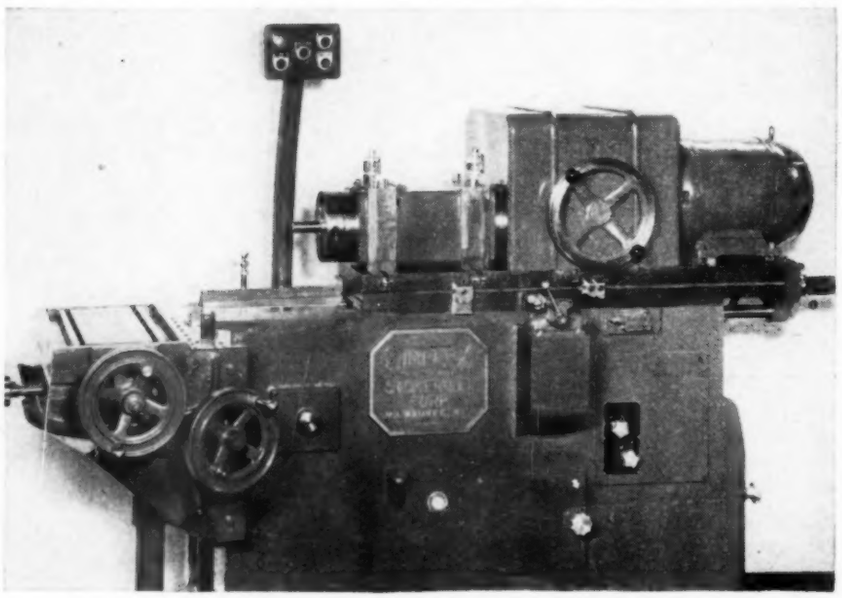


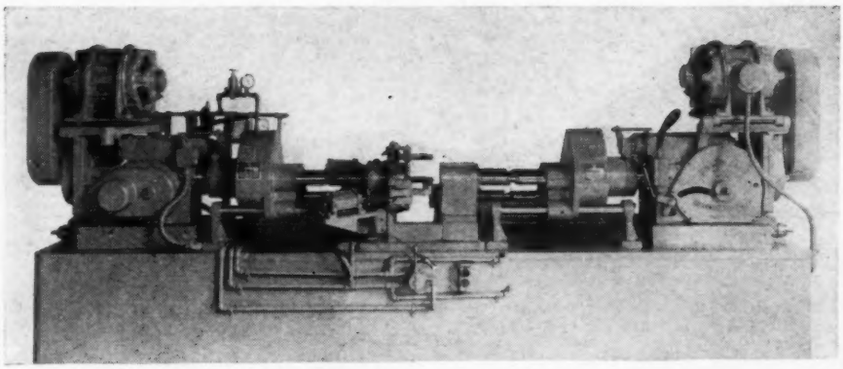
VERTICAL BORER—*Giern & Anholtt Tool Co., 1301 Mt. Elliott Ave., Detroit 7, Mich.* A vertical boring machine for precision rough and finish boring large cylinders up to 40-in. in length and 6 to 8 in. in dia. Model TR is hydraulically operated with a feed for 8-in. inside diameter tubing of 4 ipm. in roughing and 4½ to 5 ipm. in finishing.



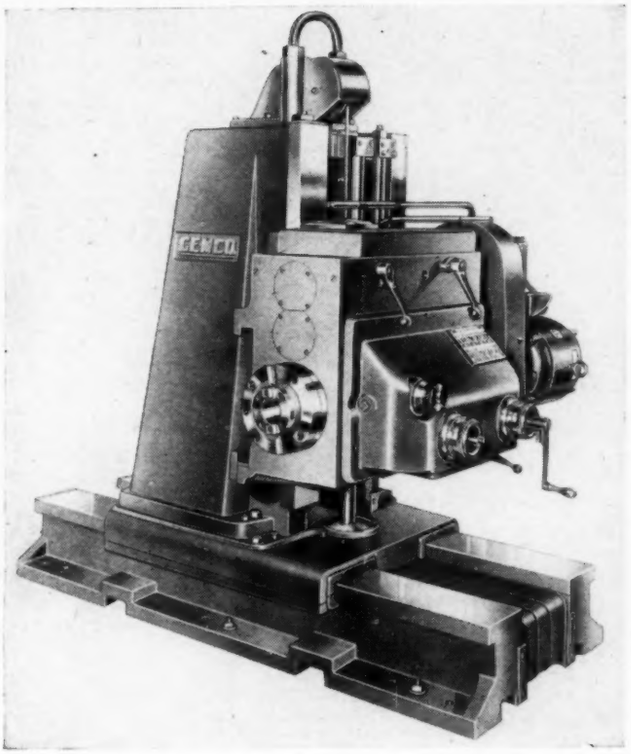
PORTABLE BORING MACHINE—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Portable machine tool has a swivel head and swivel column. May be lowered through an opening as small as 100-in. dia.

BORING MACHINE — *Stokerunit Corp., 4548 W. Mitchell St., Milwaukee, Wis.* 3U knee-type precision boring machine. The knee-type unit adds flexibility where a variety of jobs are to be handled by one machine, permits fixtures of simple design to be used.

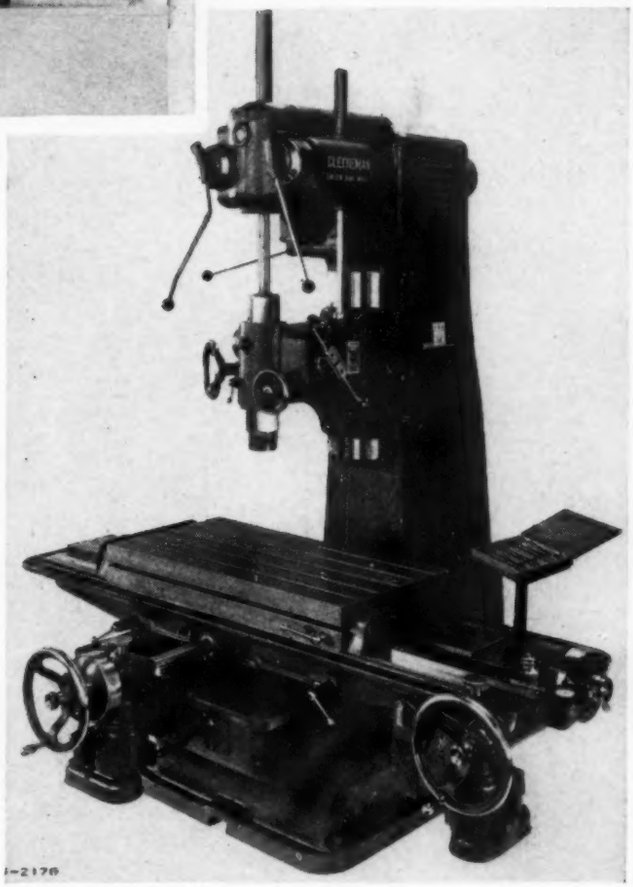




BORING MACHINE—*W. K. Millholland Machinery Co., 748 Fairfield Ave., Indianapolis 5, Ind.* Three bearing holes in a gear case and mating cover are rough and finish bored, counterbored, finish faced and chamfered in the machine. Work is clamped in an air-operated fixture and cycle is started by a pushbutton.

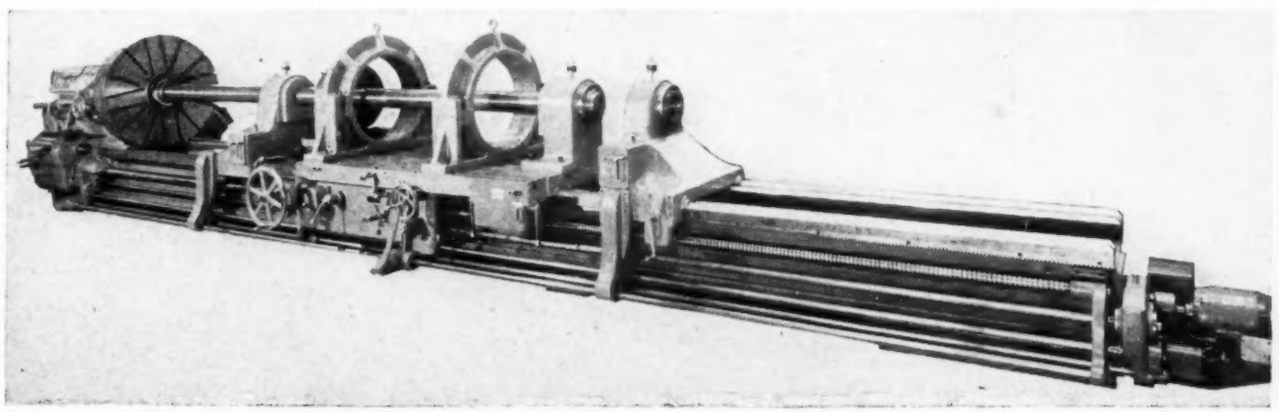


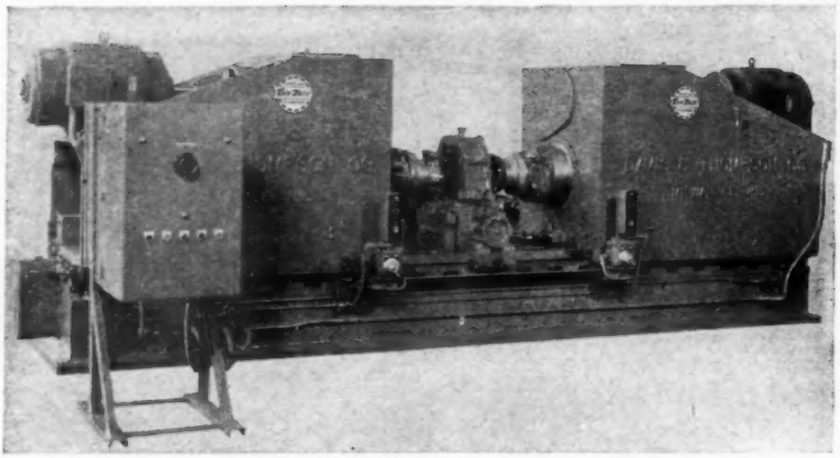
BORING, FACING MACHINE—*The General Engineering & Mfg. Co., St. Louis, Mo.* Intended for boring, facing, back-facing, drilling, and tapping operations on surfaces of heavy cumbersome workpieces which may not be accessible to standard machine tools, the entire spindle housing is advanced toward the workpiece. Can be used either as a stationary or portable boring unit.



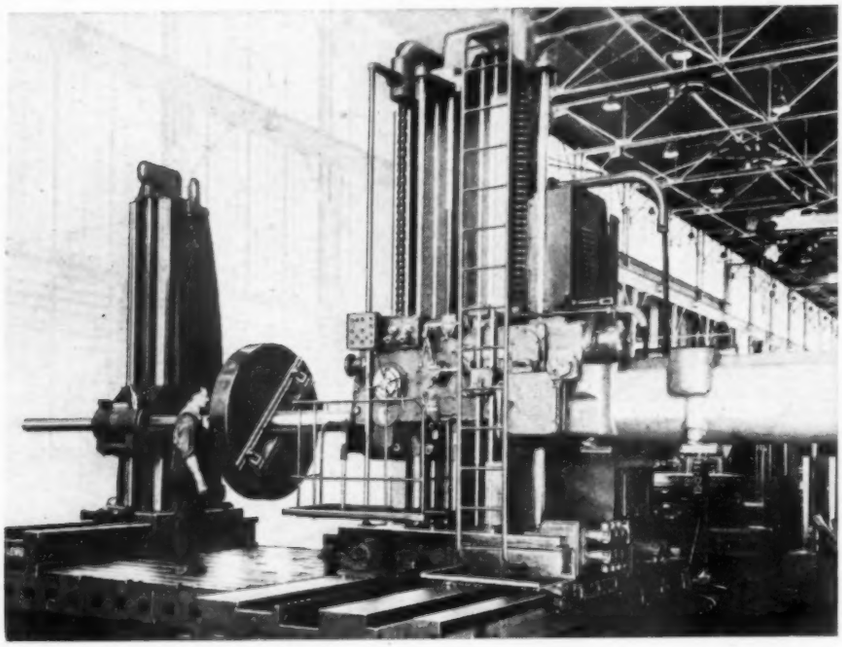
BORING LATHE—*American Tool Works Co., Cincinnati 2, Ohio.* Equipment designed for finish-boring cylinder liners up to 28-in. in dia. is a 48-in. "Super-Productive" lathe with a 34-ft. one-piece bed. It is driven by a 30-hp., 3 to 1, adjustable-speed dc. motor. The boring bar is 7 in. in dia. 19-ft. long, and ground its entire length. The 2400-lb. boring bar remains mounted in the lathe at all times.

JIG BORER—*Cleereman Machine Tool Co., affiliated with Bryant Machinery & Engineering Co., 400 W. Madison St., Chicago, Ill.* Master Model 1836 has changes from the previous design to produce greater accuracy and convenience of operation. The quill is now made from nitralloy. The cross spindle and quill are cut for a 24-pitch rack instead of a 12-pitch rack. The table has been increased ½ in. in thickness.





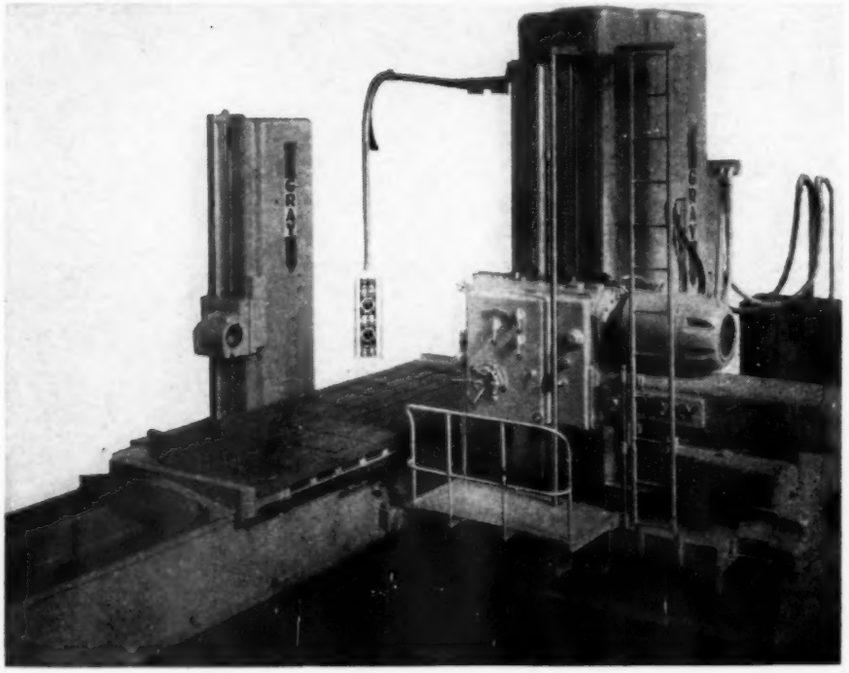
BORING HEAD—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* A continuous feed facing and boring head makes possible a variety of boring, turning, grooving, recessing, and threading operations which are difficult to handle on ordinary equipment. Continuous feed facing heads are available in sizes ranging from 17- to 60-in. dia. Cross travel of the toolslide ranges from 10 in. on a 22-in. dia. head to 34 in. on a 60-in. head. The maximum facing diameter is 32 in. using a 22-in. continuous feed facing head and 96 in. when a 60-in. facing and boring head is used.

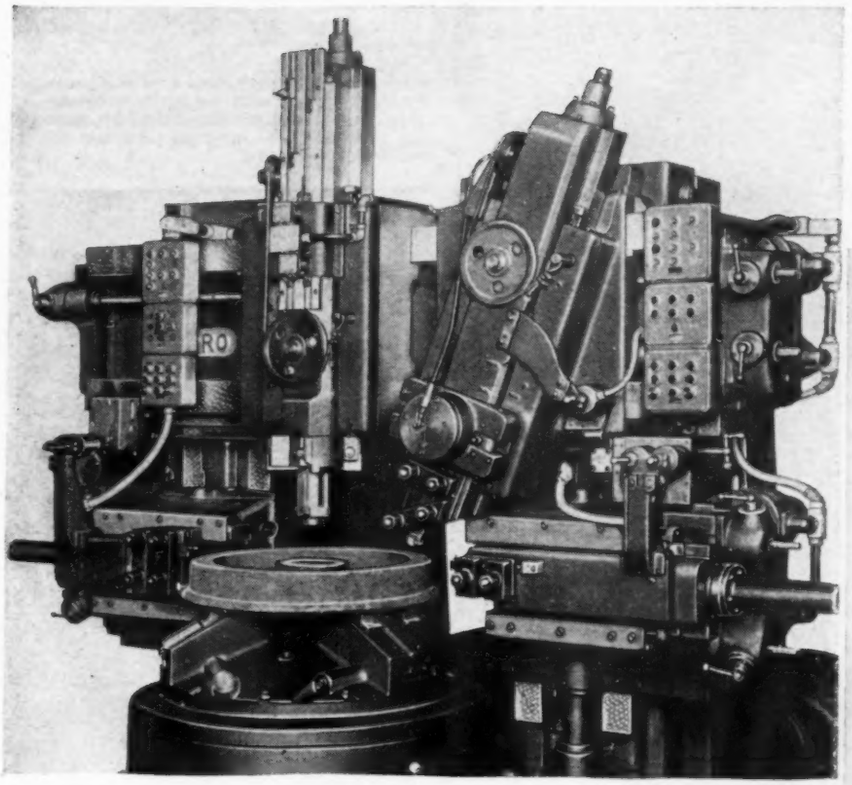


DOUBLE BORING—*Davis & Thompson Co., 4411 W. Burnham St., Milwaukee 14, Wis.* Boring, facing, chamfering and counterboring are accomplished on electric motor frames in one setup with this Model 2W two-head boring machine. Hydraulic power, electrically or manually controlled, actuates feed cycle. Spindle speeds vary from 80 to 320 rpm. Feed ranges from ¼ to 7 ipm., rapid traverse and return being at 200 ipm.

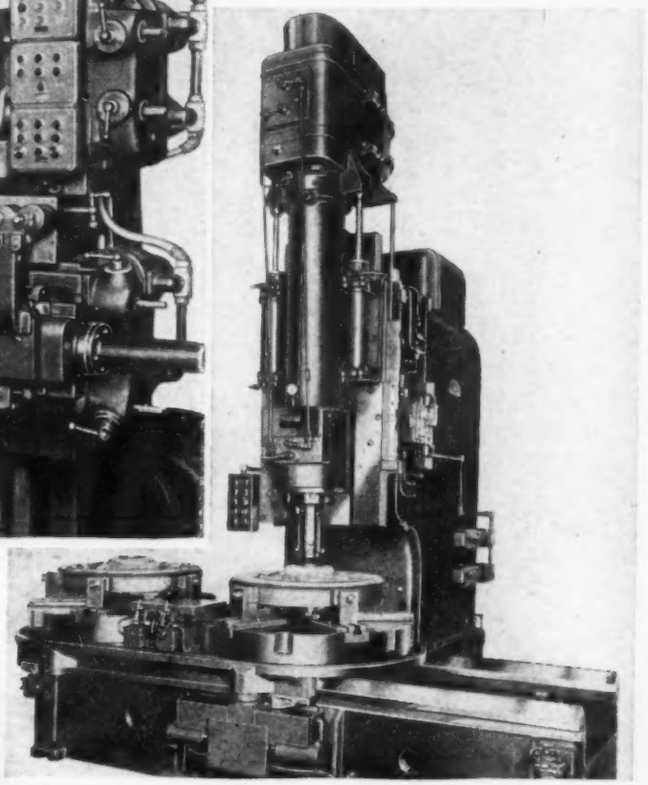
HORIZONTAL BORING MACHINE—*G. A. Gray Co., Cincinnati, Ohio.* Planer-type horizontal boring, drilling and milling machine includes Gray non-metallic ways for the table and column base, electronic drive for all feeds, and automatic power clamping of the table, column, headstock and end supports. Controls for the head, column, spindle and table are centralized on the pendant switch. The single heavy-duty spindle is provided with 24 speeds in geometric progression. The normal range for the 5- and 6-in. bar is from 4½ to 900 rpm., and for the 7- and 8-in. bar from 2½ to 500 rpm.

CIRCULAR DIVIDING TABLE—*Cosa Corp., 405 Lexington Ave., New York 17, N. Y.* The SIP Rotoptic has been designed for use with the Hydroptic B jig boring and milling machine. It will withstand transversal stresses due to milling work. The worm is used only to rotate the platen, with angular measurements being made optically. Precise measurements are made of a built-in graduated circle with a microscope.

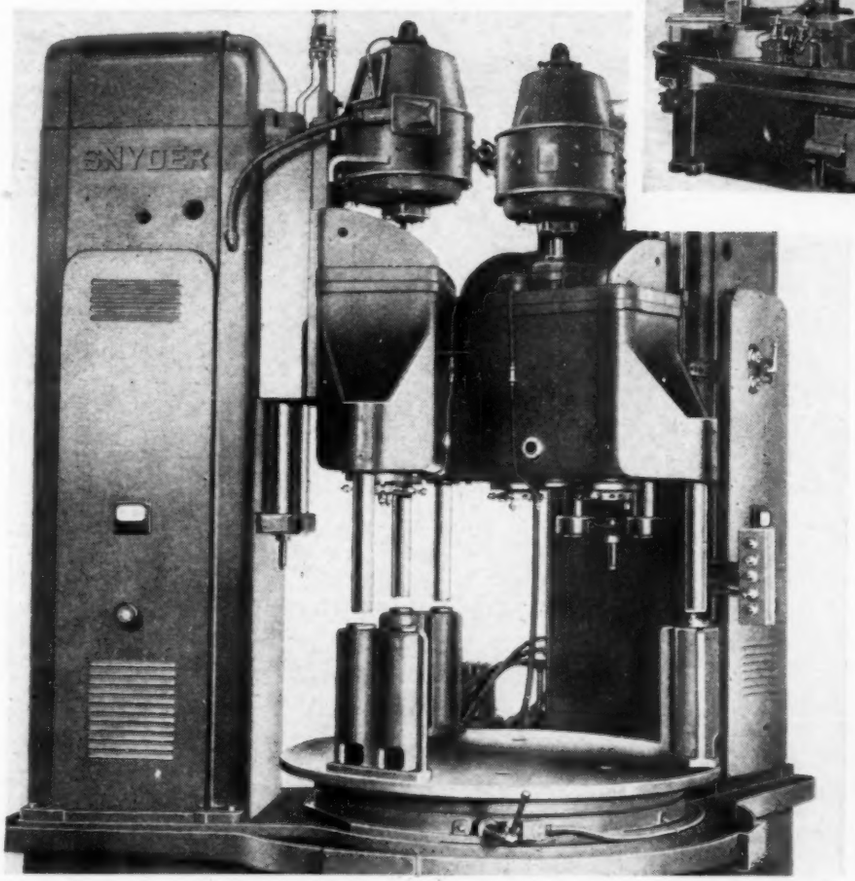




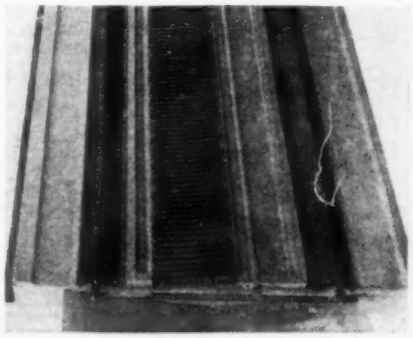
BORING AND TURNING MILL—*The Cincinnati Planer Co., Oakley, Cincinnati 9, Ohio.* Cincinnati Hypro automatic boring and turning mill has a new chucking method to center the wheel so that after it has been machined the rim thickness is balanced. The three chuck jaws operate from a central lever and hold the wheel in position with the hole free for boring and the rim, flange, and tread free for turning.



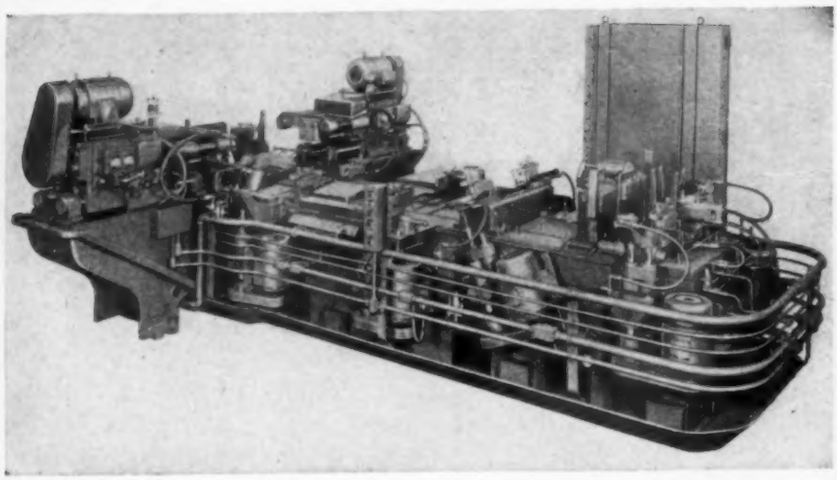
RAILWAY WHEEL BORER—*Snyder Tool & Engineering Co., 3400 E. Lafayette Street, Detroit 7, Mich.* A special-purpose, automatic-cycle machine for rough and finish boring wheels for railroad cars is designed to maintain its efficiency for a 20-year life. On steel wheels, the cutting time for finish boring ⅛ in. stock per side is 1 min. 20 sec. for a hole 7-in. long and 7-in. in diameter. A 19-in. stroke is provided so rough and finish boring may be performed successively.



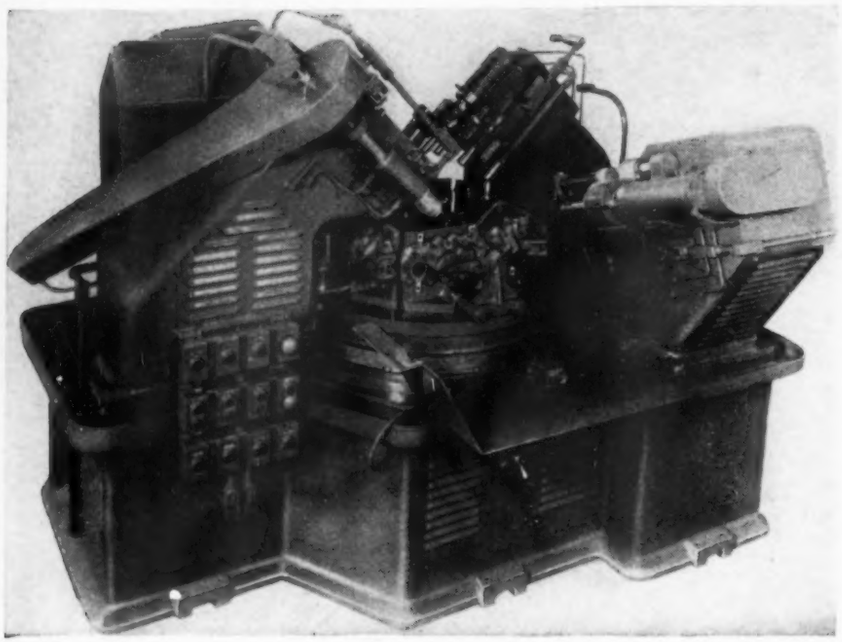
ROUGH AND FINISH BORING—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit 7, Mich.* This special machine handles boring on a variety of sizes of compressor casings and cylinders. Boring heads are individually driven by variable-speed dc. motors. Once set, the spindle speed, rate of tool feed, and depth of cut are automatically maintained.

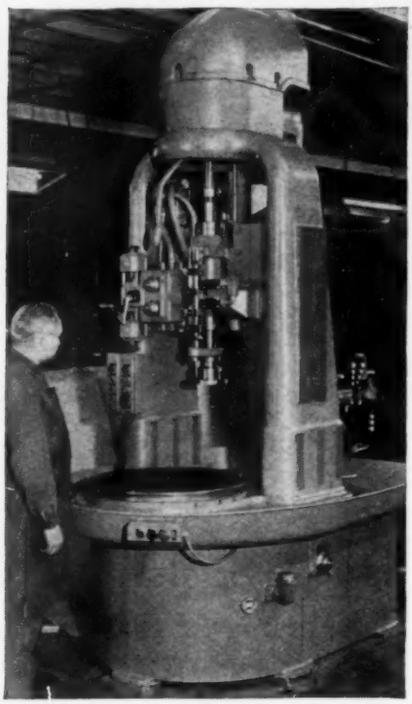


PLASTIC TABLE WAYS—*G. A. Gray Co., Cincinnati, Ohio.* Non-metallic table ways consisting of laminated plastic plates secured to the table by laminated plastic pins are used on Gray planers. The plastic plates are said to transmit practically no heat to the table.



AUTO FRAME DRILLING—*Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* This special machine for drilling holes in automobile frames accommodates three different sizes, with adjustments made by moving the entire clamping bracket as well as the spindle.

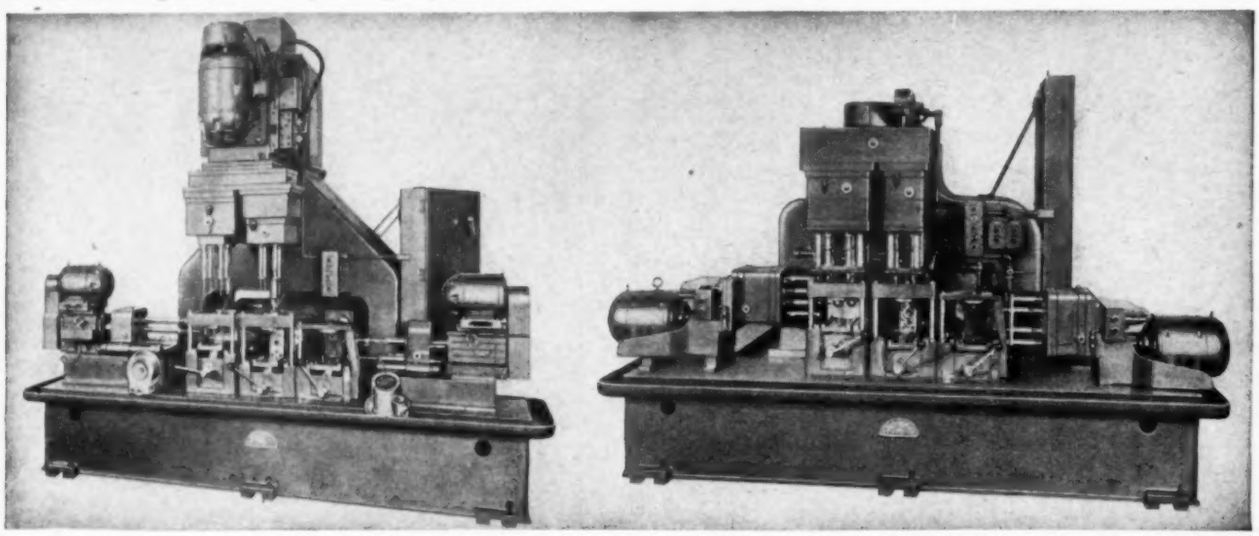


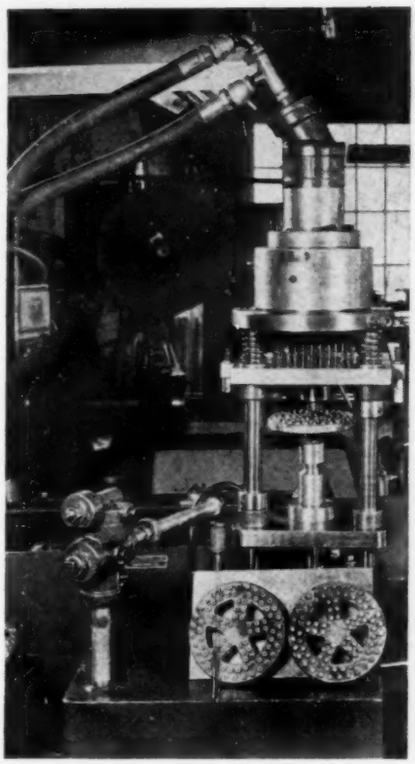


AUTOMATIC DRILLER—*Edlund Machinery Co., Inc., Cortland, N. Y.* The Drill-O-Matic is said to automatically perform intricate and precision drilling, countersinking, counterboring, spot-facing, reaming and tapping operations. The frame is mounted on standard spacers and the spindle can be elevated to any desired height by the addition of spacers.

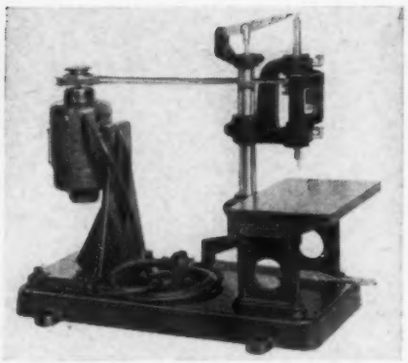
DRILLING AND TAPPING—*Snyder Tool and Engineering Co., 3400 East Lafayette, Detroit 7, Mich.* Machines for drilling and tapping two separate pump housings. On each machine, the first fixture accommodates one housing, the second and third fixtures take another housing in two positions.

SPECIAL MACHINE—*Hydraulic Machinery, Inc., 12825 Ford Road, Dearborn, Mich.* Drilling, spot-facing, counterboring, and tapping of vacuum holes in intake manifolds is performed on this four-stage machine. Operating cycle is automatic except for loading and unloading with a production rate of 120 manifolds per hour. Safety provisions prevent indexing of the table until the part is properly clamped in position.

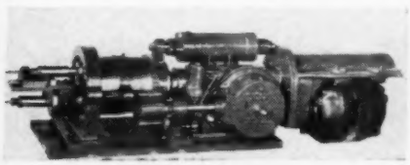




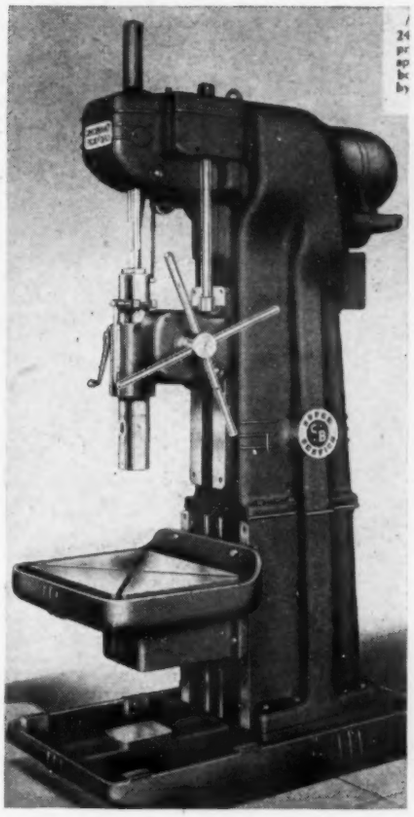
GEARLESS DRILLHEAD — *Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.* Speed of drills can be predetermined to revolve from 0 to 3000 rpm. in the Gearless 1500 Series Multiple drillhead. Power is from a Vickers reversible, variable-speed drive motor.



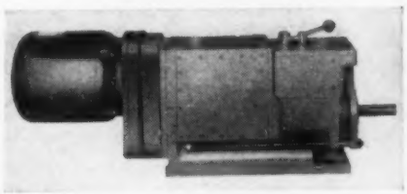
SENSITIVE DRILL—*Massasoit Machine Co., 232 Grove St., Waltham, Mass.* Improved design of Lord & Davis supersensitive high speed drill press for drilling small holes. Speed has been increased from 23,000 to 25,000 rpm. A lighter chuck is used to make operation of the machine more sensitive. Holes can be drilled from 0.004 to 1/16 in.



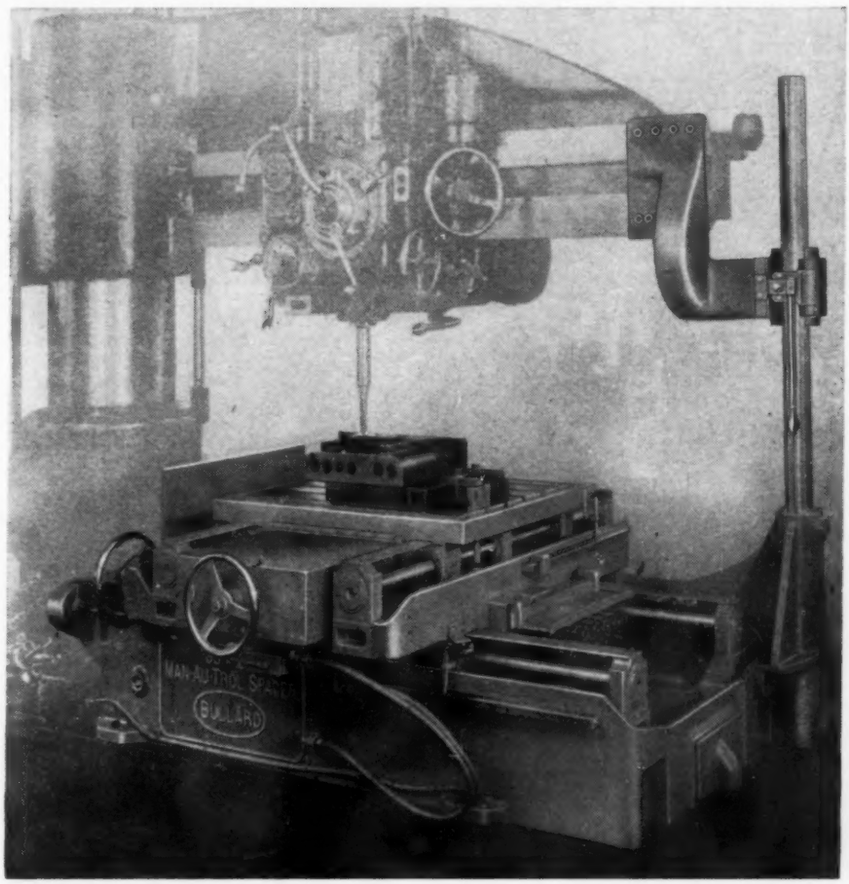
AUTOMATIC UNIT—*W. K. Millholland Machinery Co., 1048 Fairfield Ave., Indianapolis 5, Ind.* Automatic drilling and tapping unit drills and taps pipe plug holes in automobile rear-axle housing, while other operations are in progress. The unit is a standard work unit with a two-spindle head attached.



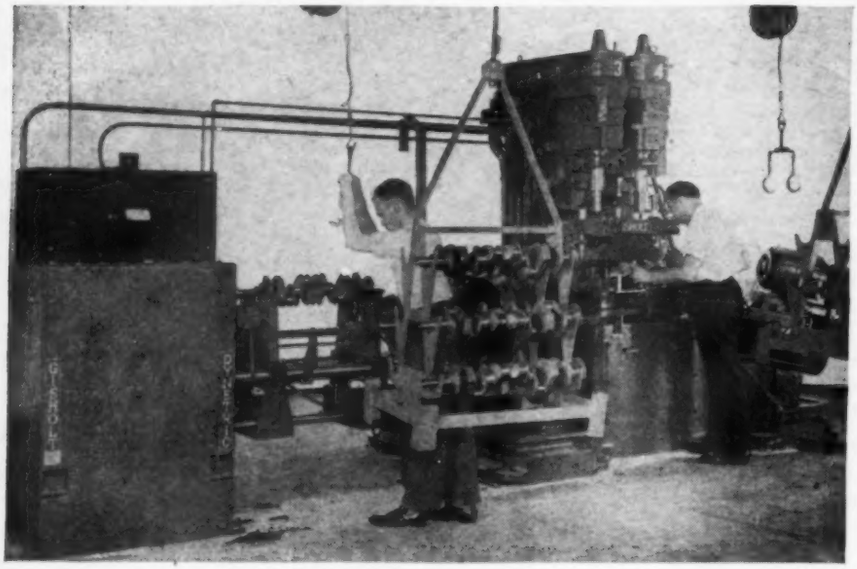
UPRIGHT DRILLS—*Cincinnati Bickford Tool Co., Cincinnati, Ohio.* These machines are built in 21-, 24-, and 28-in. sizes and have driving motors from 3 to 10 hp. Standard motor speed is 1200 rpm., although 900- or 1800-rpm. motors can be obtained. Change gears give 16 speeds and 8 feeds. Adjustable automatic tapping reverse arrangement is available.



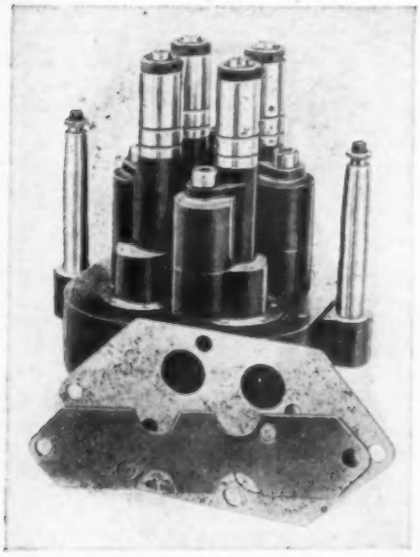
DRILL POWER UNITS—*Hole Engineering Service, 13722 Linwood Ave., Detroit 6, Mich.* A drilling, reaming, counterboring and spotfacing unit, Hesco Model 100, is of completely mechanical construction and provides positive feed rates. The unit is available in either belt or motor-driven types and can be mounted at any angle.



SPACER—*The Bullard Co., Bridgeport 2,, Conn.* Pin-point precision in the drilling of holes without the use of jigs is reported possible through the Man-Au-Trol Spacer, said to result in a time-saving of 20% or better. The spacer consists of a heavy, flat table, which moves laterally or longitudinally under an accurate drill spindle fixed rigidly in one position. With the work clamped in place, the table is hydraulically traversed from one predetermined position to another by two selector controls. Once the stops are set, the table will return to them with extreme accuracy.

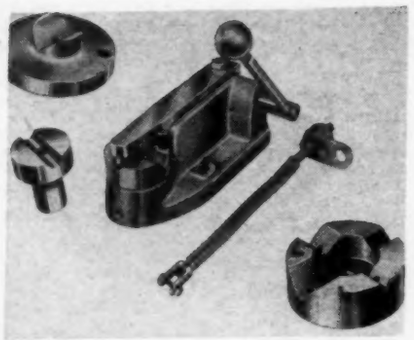


CRANKSHAFT BALANCER—*Gisholt Machine Co., Madison 3, Wis.* Two-element machine for measuring and correcting crankshaft unbalance consists of a Type C "Dynetric" balancing machine electrically connected to a multiple-spindle drilling machine. At 85% efficiency the unit will balance and correct 30 Plymouth crankshafts an hour.

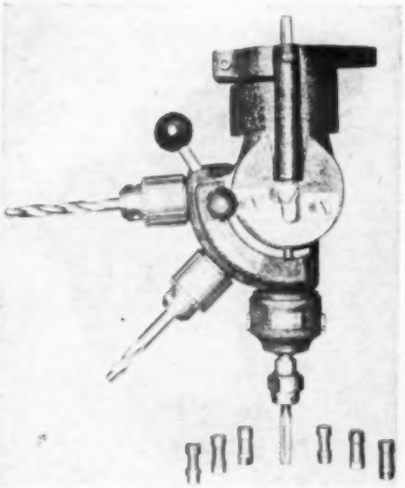


DRILLHEAD—*Wisconsin Drill Head Co., Ltd., distributed by Strutz & Mead Co., Inc., 1225 N. Water St., Milwaukee 2, Wis.* Adjustable drillhead in which each drill revolves completely around two different centers, each of which has a 15/16-in. radius. Each drill point can be located and locked at any point in the area of a 3¾-in. circle.

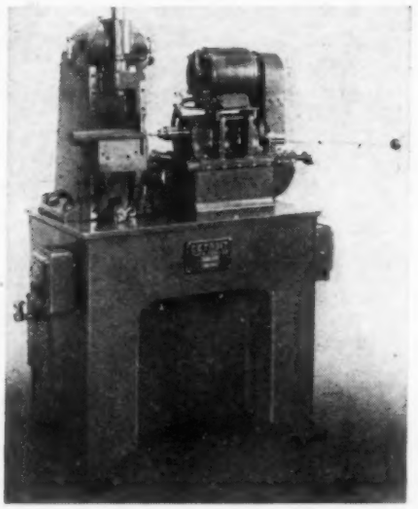
DRILLPRESS ATTACHMENTS → *Weaver Corp., San Diego 1, Calif.* The "Multi-6-Spindle" has six vertical spindles. The unit is attached to the drillpress column by a simple cast-iron bracket. Up to six different operations can be performed on the same working center without changing setup. The "Vari-Speed" unit is intended for V-belt driven drill presses. Two telescoping disks increase or decrease the speed ratios between the drillpress motor and the drive as the single hand-lever control is advanced or retarded along the control track.



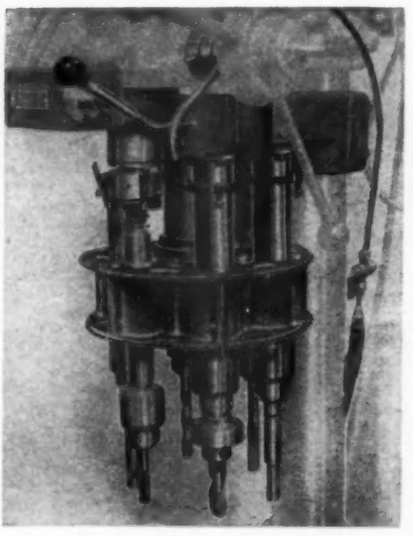
DRILL JIG—*Manufacturers Engineering Service, Inc., 415 Security Bank Building, Toledo, Ohio.* Kam-Grip can be either operated manually or in conjunction with the drillpress spindle. As the drillpress spindle is lowered, cam action lowers the front end applying pressure on the part to clamp it in the jig.

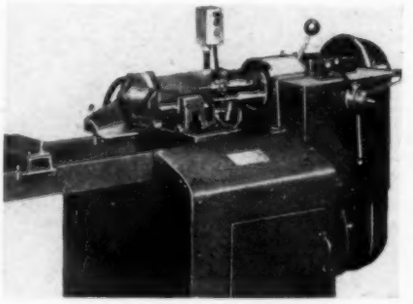


DRILLPRESS TURRET—*Universal Engineering Co., 2230 National Ave., San Diego 2, Calif.* A three-position drillpress turret head for drilling and tapping at a single station includes a reversing tapping head with a collet-type chuck. Collets made of alloy tool steel for taps from No. 8 through ½ in. are furnished.

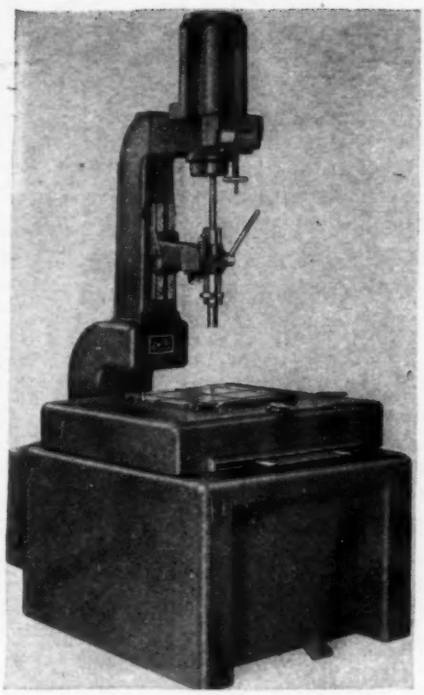


CENTER DRILL—*Detroit Tap & Tool Co., 8432 Butler Ave., Detroit 11, Mich.* Automatic centering and clamping are included on high-production center drilling machine. A single lever controls all operations, including automatic positioning, clamping and feeding the drill.





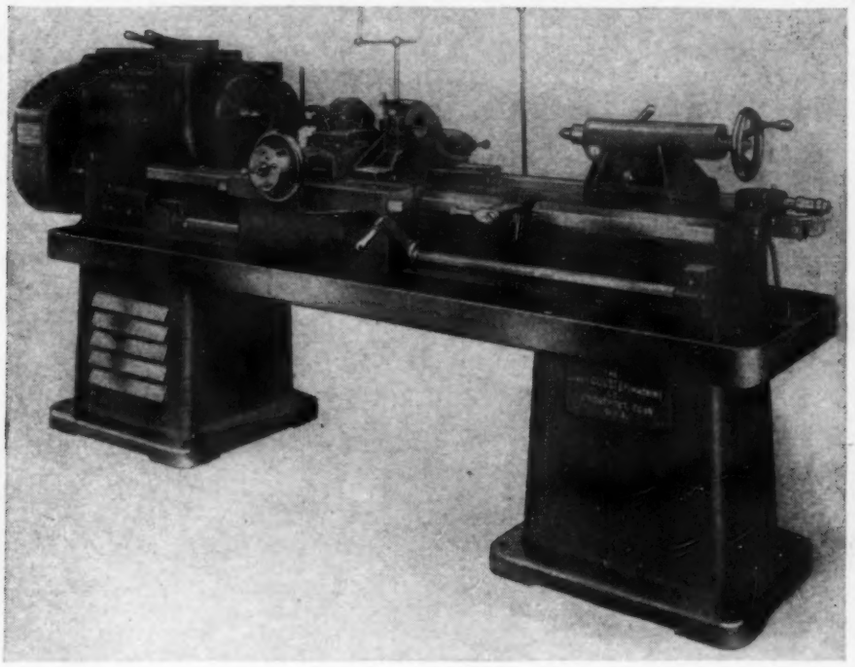
DRILLING AND TAPPING MACHINE—*The Cleveland Tapping Machine Co., 3610 Superior Ave., Cleveland, Ohio.* Horizontal combination drilling and tapping machine is for pieces up to 96 in. long. The work is automatically clamped and not moved until drilled and tapped. Each spindle can be independently adjusted for depth of travel and held to within 0.010 in. horizontal travel.

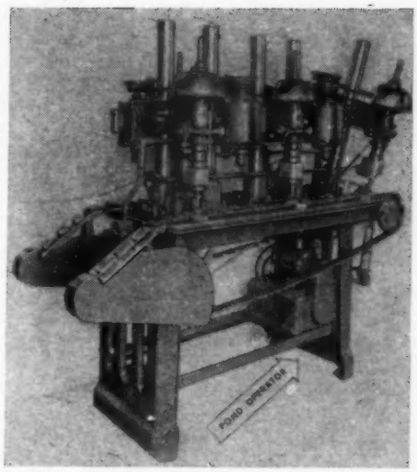


LOCATING, DRILLING MACHINE—*Speed-Way Machine Co., 23 Harmon St., Worcester 8, Mass.* A machine for locating and drilling which uses a projection magnification system is supplied separately for use under a radial drill or equipped with drillhead for spotting, drilling, and tapping. It can be adapted to inspection work.

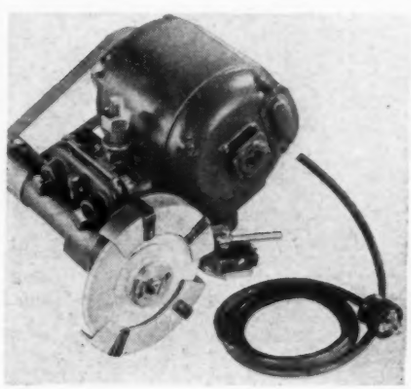
BENCH DRILL—*Dumore Co., Racine, Wis.* A lightweight, high-speed bench drill for drills ⅛ in. and smaller is designed particularly for use in drilling small parts of metal, wood, or plastic. The drillhead and table can be adjusted vertically or in any position around the collet. A hand control elevates the table to perform the drilling operation. A 1/30 hp. motor with a range of 2,000 to 15,000 rpm. supplies the power.

THREAD GRINDERS—*Walz & Krenzer Inc., Rochester 7, N. Y.* Ball-bearing spindle which can be adjusted for helix angles is used in three Grindall portable thread grinders. The Model M ½-hp. grinder has speeds up to 21,000 rpm. The Model R and K grinders are 1 and 2 hp. respectively for ➔

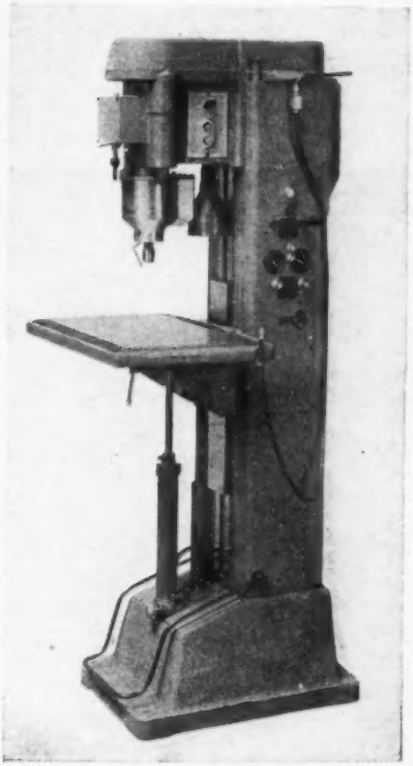




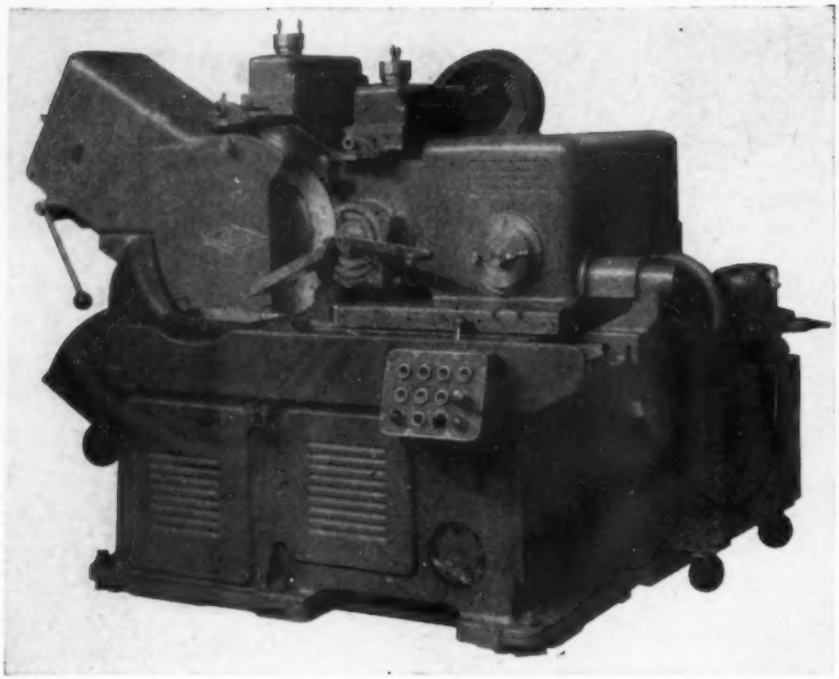
AUTOMATIC TAPPER—*Pond Engineering Co., Springfield, Mass.* An automatic control unit enables 5 drill spindles to be mounted and operated on 3-spindle tables. Two chain conveyors carry the pieces on equally-spaced carriers across the table and under the machine. Tapping heads, fitted to each spindle, are actuated simultaneously so that 5 holes are tapped at one cycle.



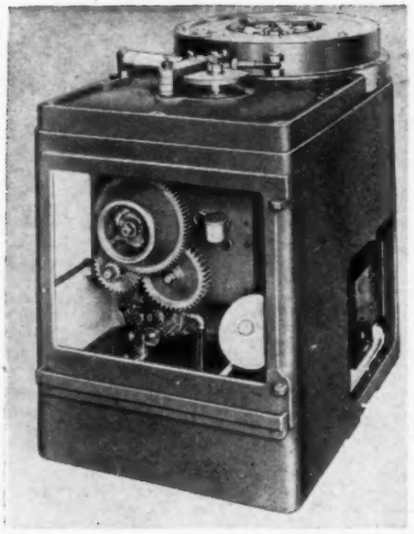
THREADING LATHE—*James Coulter Machine Co., 629 Railroad Ave., Bridgeport, Conn.* Automatic threading lathe, Type A, Model L1, for threading long traversing, elevating, and feed screws, is equipped with a disk clutch.



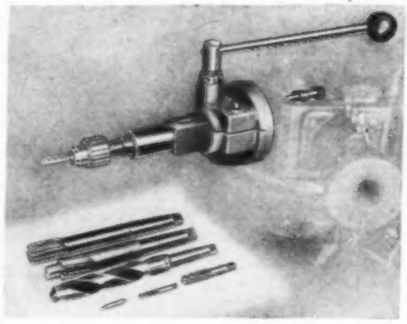
TAPPING MACHINES—*R. G. Haskins Co., 2760 W. Flournoy St., Chicago 12, Ill.* "Electric-Air Controlled" tapping machines, Type U, include a new frame design, new principles in piston and air-cylinder construction, new-air-operated table raising unit. No. 1-UT, has rated capacity of No. 2 to 3/16-in. mild steel; No. 2-UT, capacity of No. 6 to 5/16-in. and No. 3-UT, capacity of No. 10 to ⅜-in. N.F.



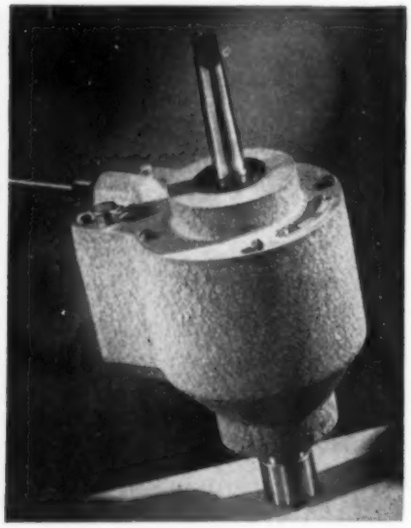
THREAD GRINDER—*Landis Machine Co., Waynesboro, Pa.* Universal centerless thread grinder, Model No. 1. Screw threads can be ground on straight cylindrical workpieces as well as on headed or multiple-diameter parts. Operation is by either the throughfeed or infeed method. An automatic hopper is available for throughfeed grinding. When equipped with an automatic hopper the machine is fully automatic in operation except for dressing the wheels and making size adjustments.



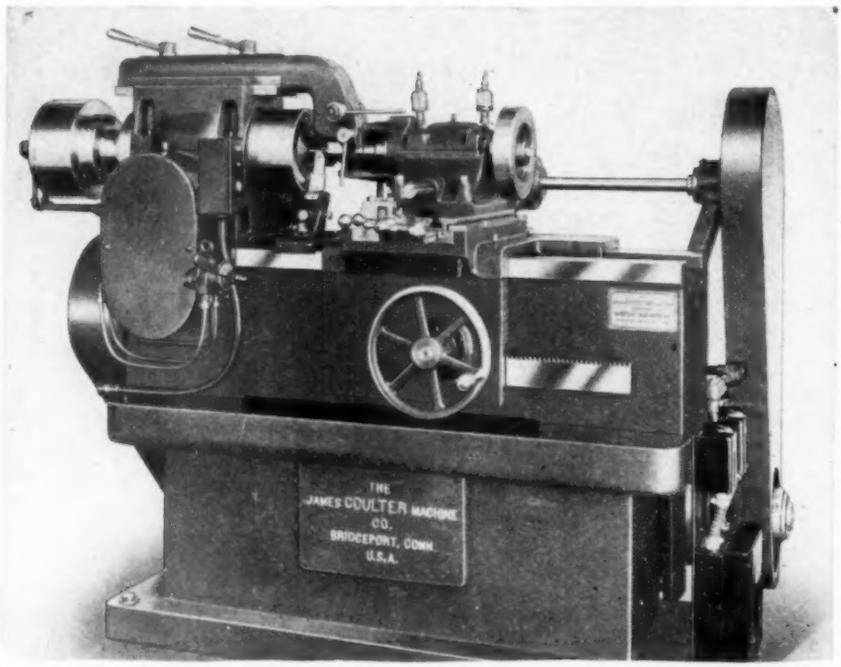
THREAD-ROLLING MACHINE — *Rolled Thread Die Co., 237 Chandler St., Worcester 2, Mass.* The Model A22 Reed thread-rolling machine has work blank supported and positioned vertically between three synchronously rotating cylindrical dies. Standard dieholders are available for thread diameters from ¼ to 2⅝ in. and thread lengths up to 1½ in.



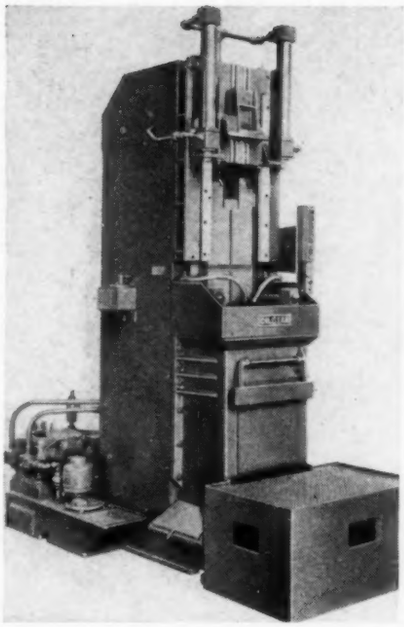
← TURRET ATTACHMENT — *Sudbury Grinding Co., Sudbury, Mass.* With the attachment mounted on one of the positions of the turret, sensitive control of tapping operations from 6/32 in. to 4 in. is obtained. The attachment can be used for other operations where sensitive control is required. The attachment has a 9-in. travel.



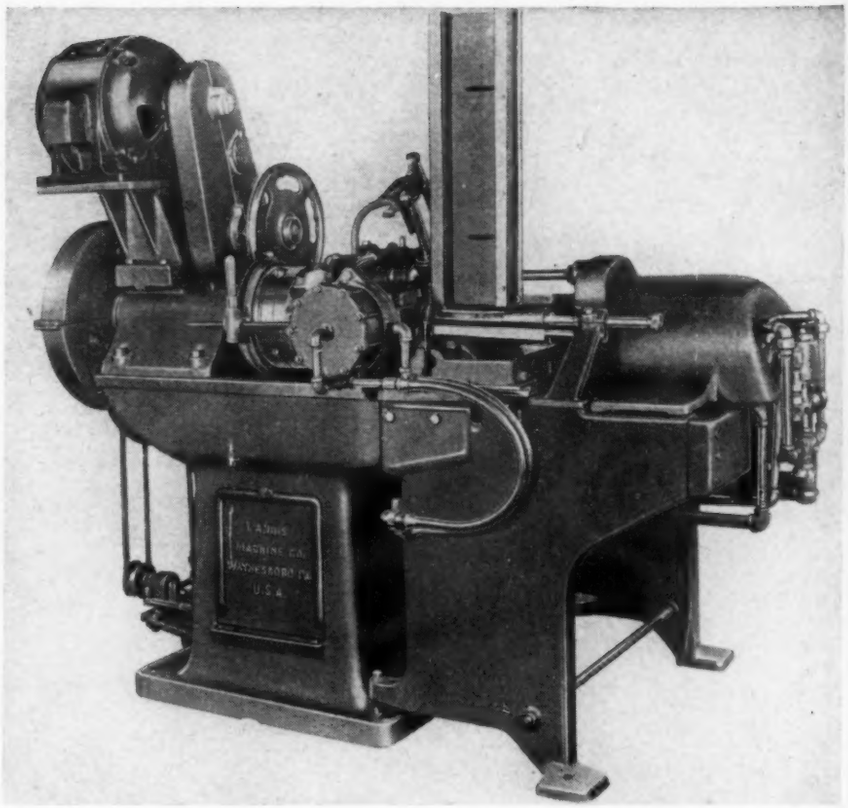
TAP HEAD—*R. G. Haskins Co., 615 S. California Ave., Chicago 12, Ill.* Tap head designed to fit any standard drilling machine is available in three sizes. No. 1 has either No. 1 or No. 2 Morse taper shank; No. 2 has No. 2 or No. 3 Morse taper shank, and No. 3 for heavy-duty operation has a quill-type adapter. The clutch is sufficiently sensitive so that it will slip if the tap meets an obstruction, to prevent tap breakage. A reversing shell engages the clutch when the tap head is retracted, changing rotation of the tap.



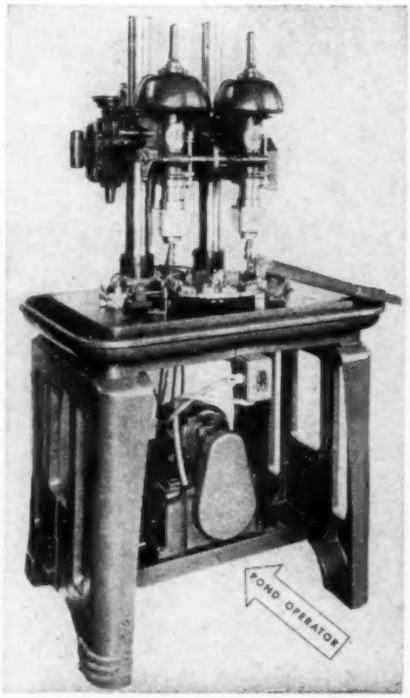
TAP THREADING—*James Coulter Machine Co., 629 Railroad Ave., Bridgeport 5, Conn.* The Type H hob-threading machine is now available for threading straight hand taps or taper pipe taps. With the new relieving attachment, taps with any number of flutes with eccentric or non-eccentric reliefs can be produced. The machine has capacity for pipe taps from ⅛-in. to 1½-in. size and straight taps from ¼ in. to 1½ in.



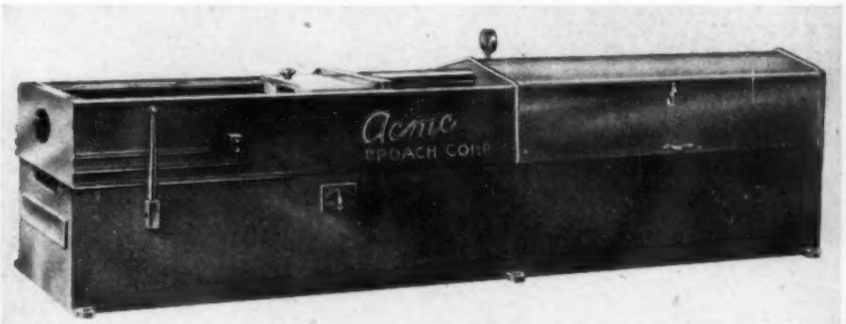
VERTICAL BROACHES—*Oilgear Co., 1301 W. Bruce St., Milwaukee 4, Wis.* Vertical pull-down broaching machines, Type XP, in five sizes vary in normal pulling capacity from 5 to 37½ tons and broaching strokes from 24 to 66 in. The machines have automatic tool handling mechanisms with adjustable brackets for tools of varying lengths. Automatic puller operation, interlocked operation of tool handling carriage and tool pulling slide are among the other features.



NIPPLE MACHINE—*Landis Machine Co., Waynesboro, Pa.* Automatic nipple machine threads, reams and chamfers both ends of space nipples. The two sizes built are the 1¼-in. machine for ½-, ¾-, or 1-in. pipe sizes, and the 2-in. machine for 1-, 1¼-, 1½-, or 2-in. pipe sizes. Two spindles are each equipped with Lanco internal-trip semi-receding pipe and nipple threading diehead and reaming attachments. The carriages have air-operated vises.

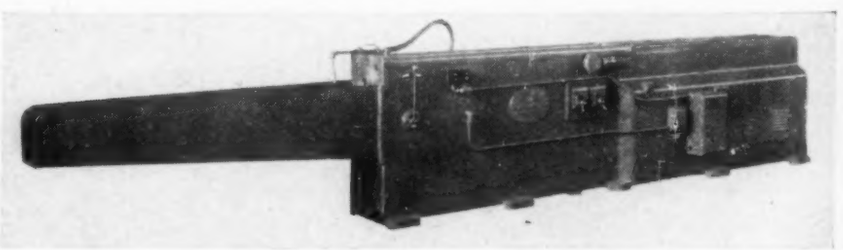


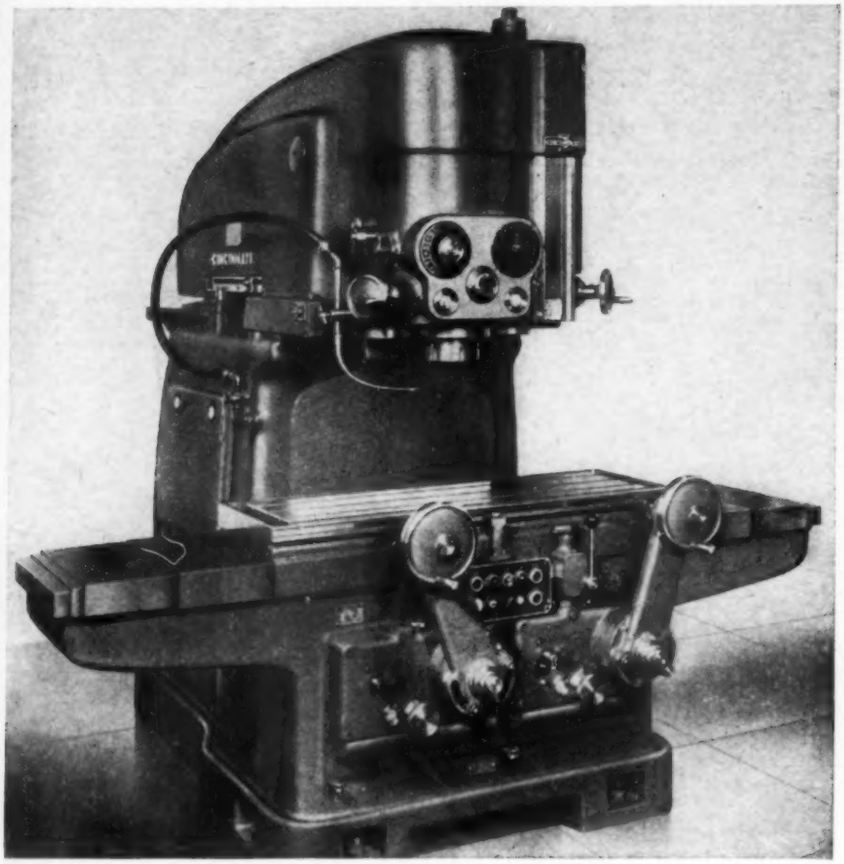
AUTOMATIC CONTROL UNIT — *Pond Engineering Co., 15 Park St., Springfield, Mass.* An automatic control unit for converting hand-operated tapping units to automatic operation has a turntable fixture actuated by a Model 600 Pond operator. A minimum of 70 psi. air pressure is required to operate the unit. Cycle speeds are adjustable from 2 secs. to 1 min. in the standard unit.



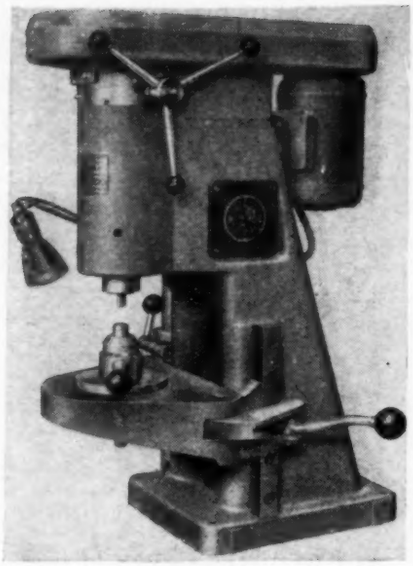
BROACHING MACHINES AND PRESSES—*Acme Broach Corp., E. 3rd St. at Delaware, Lexington 47, Ky.* Horizontal broaching machines are said to be easily set up for a wide variety of work. Made with normal capacity of 2, 4, 6 and 10 tons. Hydraulic presses can be operated either by hand or foot controls. The presses are made with normal working capacity of 2, 4, and 6 tons. The stroke is 24 in.

BROACHES — *American Broach & Machine Co., Ann Arbor, Mich.* A horizontal broaching machine for heavy-duty internal broaching, type HD, has a rolled wall construction. HD-15-66 and HD-20-66 have a normal capacity of 15 and 20 tons. They have a maximum stroke of 66 in. The broach speed can be varied from 15 to 29 fpm. in the 15-ton machine and 14 to 20 fpm. in the 20-ton machine.

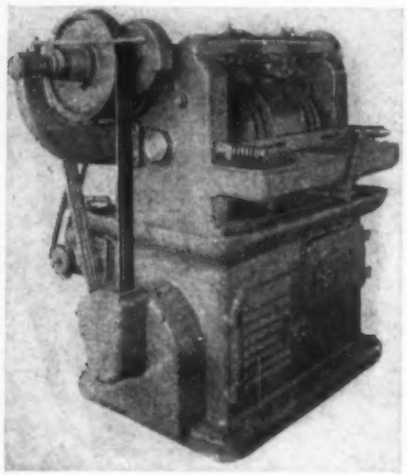




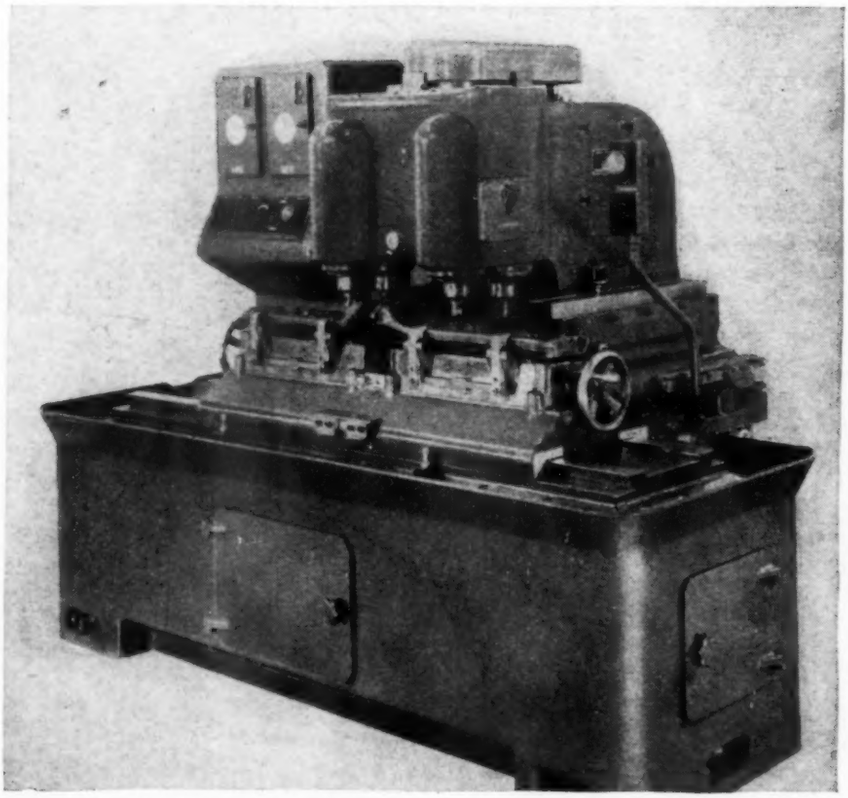
MILLING MACHINE—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Hydro-Tel 16-in. vertical is built in three distinct styles: as a general-purpose milling machine, a die-sinking machine with automatic depth control, and automatic 360° profiling machine. The hydraulic automatic depth control is a sensitive hydraulic tracer mechanism which automatically synchronizes the vertical movements to reproduce on the workpiece a contour of the templet.



VERTICAL MILLER—*Gubelin International Corp., 336 Park Ave., New York 22, N. Y.* Swisma vertical mill can be used for milling accurate vertical surfaces or drilling round, square or hexagonal holes in sizes from 5/32 to 1 in. across the flats. Holes can be drilled with flat, concave or convex sides. Corners are round with a radius 1/10 distance across flats, but can be ground or drilled out.

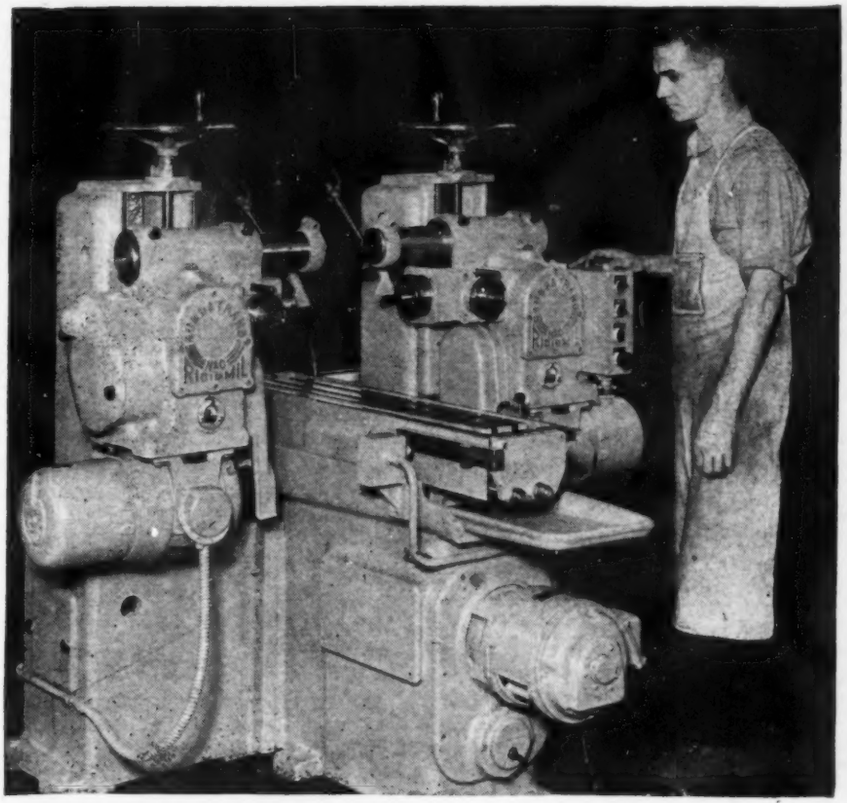


DRUM-TYPE MILLER—*Sommer and Adams Company, Cleveland 12, Ohio.* Drum-type milling machine which permits single or double milling on four parts, No. 3 Craftsman, is designed for straddle milling, slotting, or facing. Work can be quickly loaded in the chuck and is automatically ejected after milling.

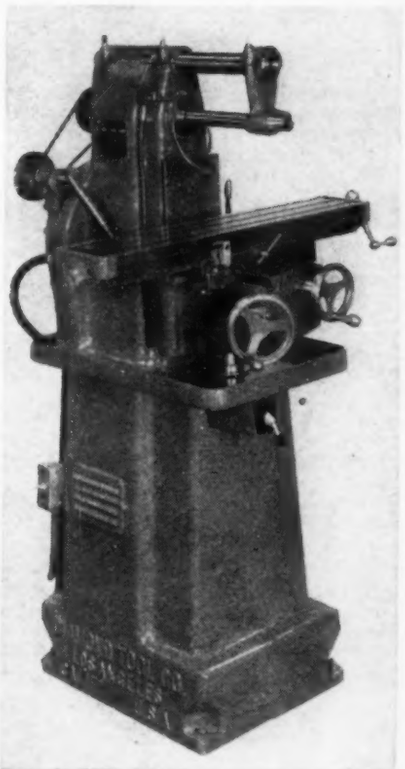


SPECIAL MILLING MACHINE—*Hydraulic Machinery, Inc., 12825 Ford Road, Dearborn, Mich.* A two-stage machine for milling the bosses of cylinder-head castings has a production at 80% efficiency of 90 per hour. While the operator is unloading and loading the part in the station away from the work position, the milling head moves in to the part at the work station.

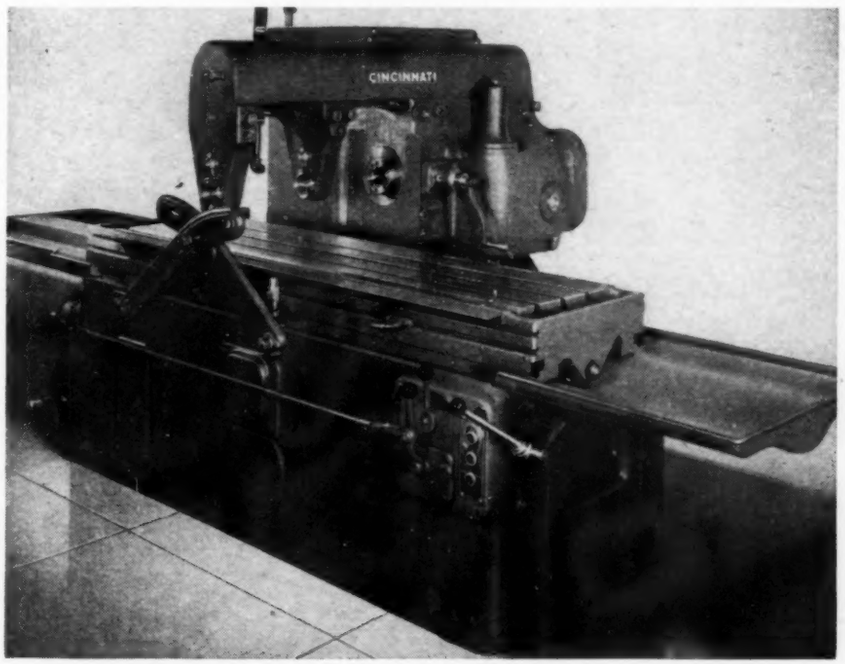
MILLING MACHINE—*Sheldon Machine Co., 4258 N. Knox Ave., Chicago 41, Ill.* The No. 3000 Sheldon-Vernon milling machine with hand screw feed is so constructed that bracket can be set next to cutter for taking extra heavy cuts without chatter. Dials are friction type, large and beveled for quick reading, graduated to 0.001 in. and activated by hand wheels.



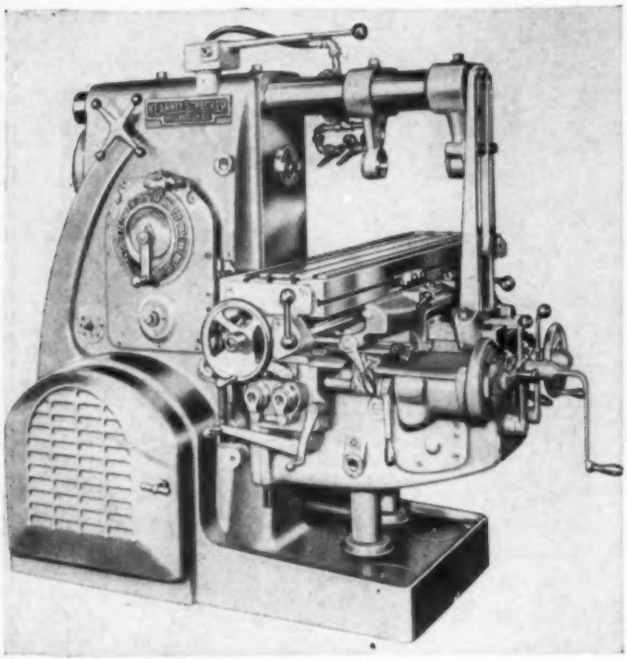
DUPLEX MILLER—*Sundstrand Machine Tool Co., Rockford, Ill.* A small duplex-type Rigidmil, No. 0, mills two surfaces simultaneously on opposite ends of small workpieces. The two horizontal-opposed spindle heads have independent vertical adjustments from 2 to 13 in. from top of table to center line of spindle. Cuts can be made at different relative heights.



MILLING MACHINE—*Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif.* Model M-30 is equipped with variable-speed drives, built-in gusher pump coolant system and a 1½-hp. motor. The table is 7 x 30 in. with 18-in. longitudinal travel, 6-in. transverse travel, and 10-in. vertical travel.



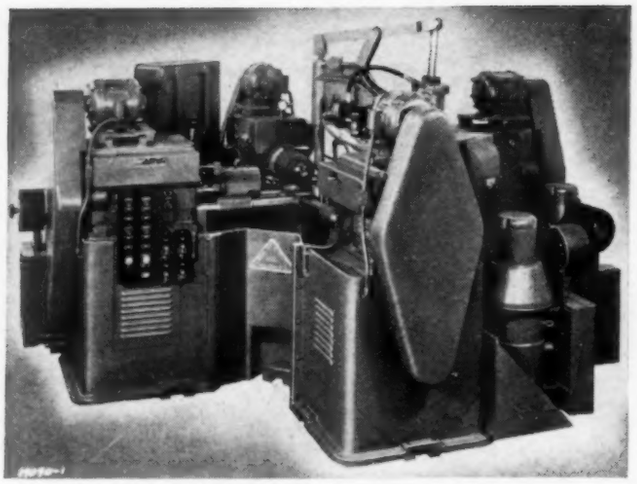
MILLING MACHINES—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Redesigned Hydromatic milling machines have heavier construction and larger motors, increased cutting capacity, and higher spindle speeds. Twelve sizes are available in plain and duplex styles, from No. 3-24 (24-in table traverse, 7½ hp.), to No. 56-90 (90-in. table traverse, 30 hp.).



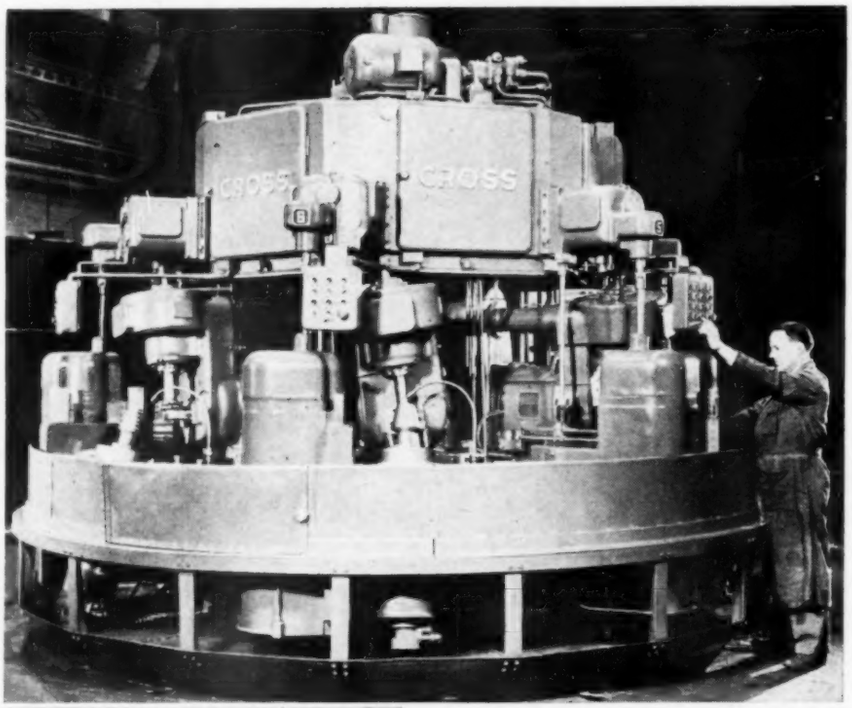
MILLING MACHINES—*Kearney & Trecker Corp., Milwaukee, Wis.* CSM line of knee-type horizontal and vertical millers are available in 20-, 30-, and 50-hp. sizes. Designed to fit basic requirements for carbide milling. Sixteen quick-change speeds from 50 to 1250 rpm. are in approximate geometrical progression. A heavy flywheel is splined to the spindle.

MOLD SHOP ATTACHMENTS—*Invincible Tool Co., 611 Empire Building, Pittsburgh 22, Pa.* Milling heads and attachments for mold-making tool shops are developed to meet special requirements encountered in mold shops.

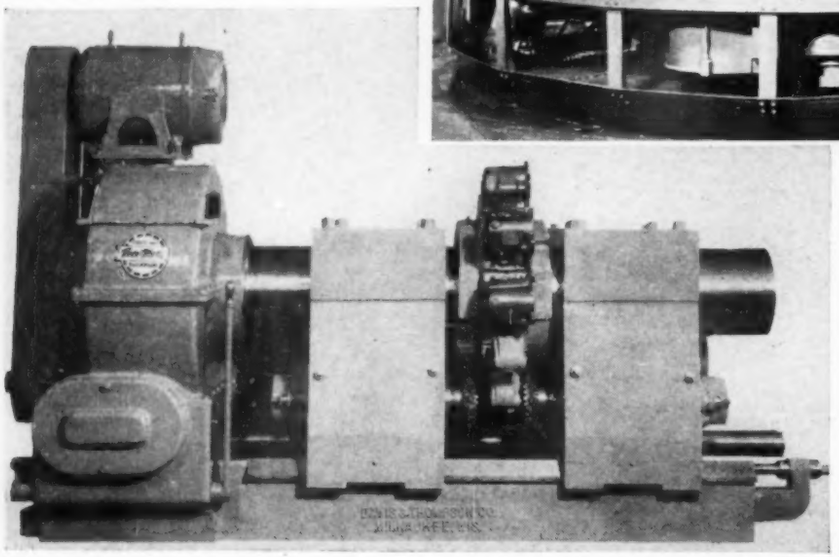
MILLING MACHINE—*Davis & Thompson Co., 6411 W. Burnham St., Milwaukee 14, Wis.* For continuous milling of parallel faces of transmission cases, the No. 2-B Roto-Matic has a work drum with 12 stations. Change gears can be set to give cutter speeds from 50 to 400 fpm., feeds from 3 to 30 in. Gross production is 126 per hour.



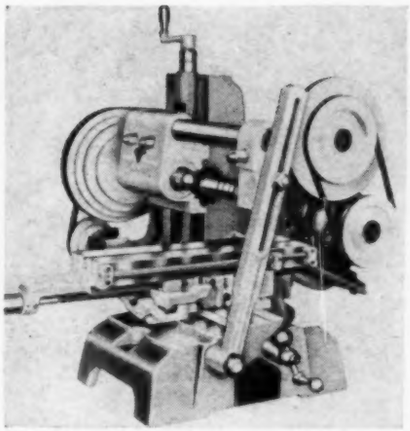
MILLING MACHINE—*LeMaire Tool & Mfg. Co., Dearborn, Mich.* A hollow milling machine for heavy duty work built up of several standard elements. Designed to hollow mill and face the shoulder on universal joint spiders with journals ranging from ½ to 1⅛ in., the machine has a No. 5000 hydraulic unit mounted on a standard base for each of the four stations.



TAPER THREAD MILLER—*The Cross Co., Detroit 7, Mich.* Taper threads are milled on 19 different models of oil drill cutters. Six self-contained, independent work stations are mounted on a circular bed with variable rotary feed. The feed is timed so each station automatically completes one piece of work during one revolution of the bed. All the operator has to do is unload and reload the pieces as the stations pass him.

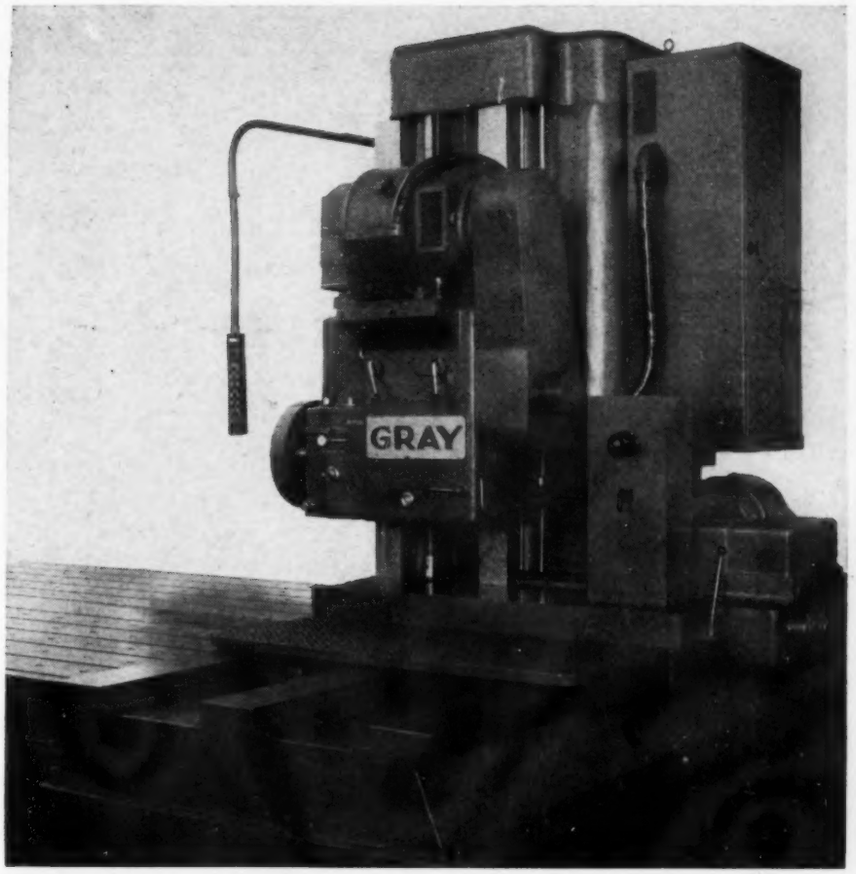


MILLING ATTACHMENT—*Marvel Millitach Co., 523 Mulberry, Evansville 9, Ind.* A milling attachment for lathes of 16 in. and larger size will handle a cutter up to 1 in. and will work within 2 in. of the chuck. Six speeds are available from 255 to 1055 rpm.

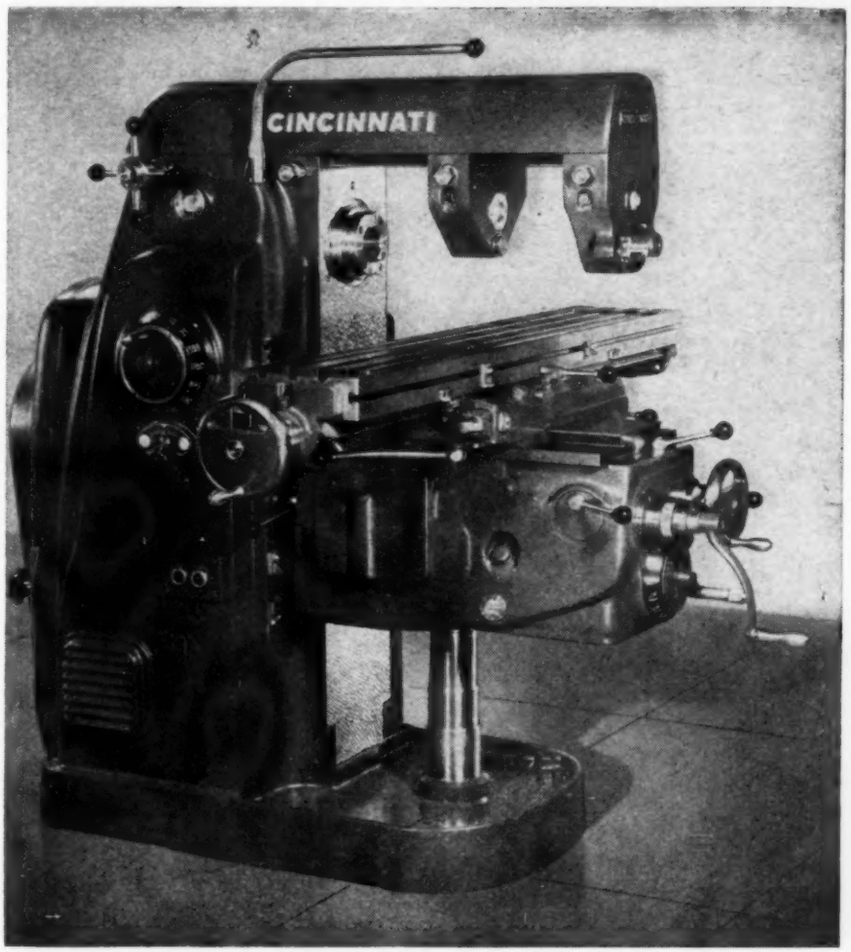


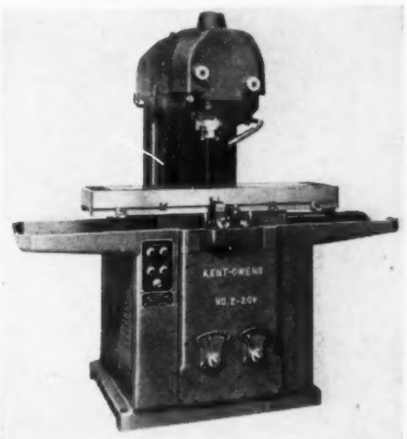
MILLING MACHINE—*Aircraft Machinery Corp., Burbank, Calif.* Armor milling machine has a rise-and-fall spindle. The horizontal spindle nose is designed for lathe operations. It will swing 22 in. Small bar stock can be fed through the taper spindle. The machine has 12-in. longitudinal, 10-in. vertical, and 7-in. cross travel.

MILLING MACHINES—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* A medium-sized, knee-and-column milling machine, the No. 2 MI, is powered by a 5-hp. motor and is available in plain, universal and vertical styles, covering the same range as the No. 2 MH which it replaces. Wide speed and feed ratios are 60 to 1 and 120 to 1 respectively, for all types of milling operations. Sixteen spindle speeds, range from 25 to 1500 rpm. ↓

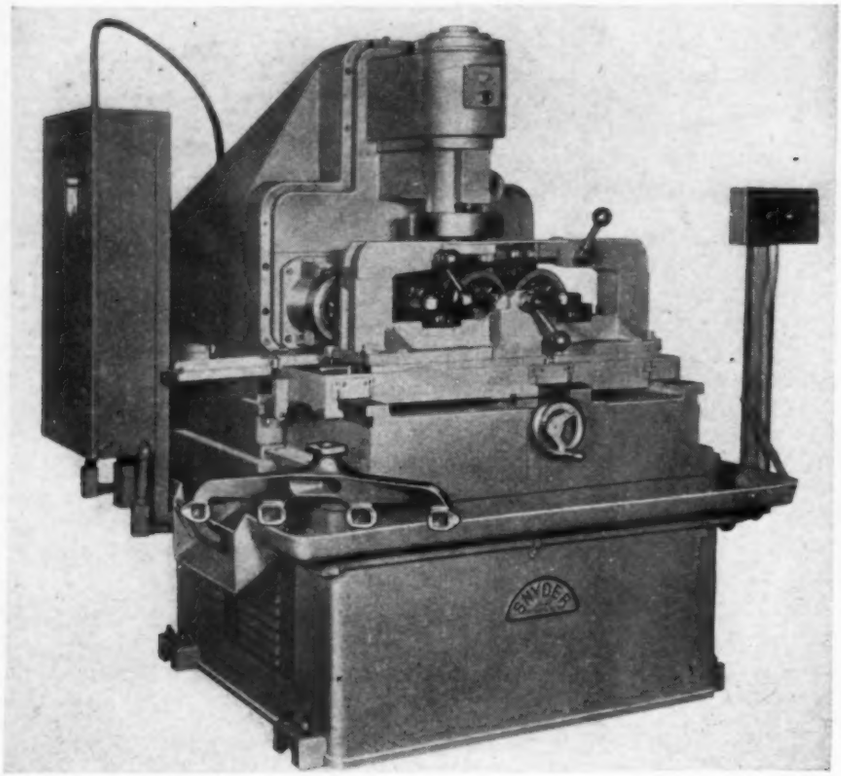


MILLING MACHINE—*G. A. Gray Co., Cincinnati, Ohio.* A traveling-head milling machine with horizontal spindle driven by a drive sleeve at a point close to the cutter, reducing the length of the spindle under torsion. A positioning device readily sets the column and head within 0.00025 in. when a micro-jog button on the pendant switch is pressed.





MILLING MACHINE—*Kent-Owens Machine Co., Toledo, Ohio.* Independent adjustment of the feed rate for opposite directions of the table travel is a feature of the Model 2-20 vertical milling machine. Table is 42-in. long by 12-in. wide with a 20-in. travel, with a fully automatic cycle. Maximum gap between nose of the spindle and the table surface is 10 in.



MILLING AUTOMOTIVE MANIFOLD —*Snyder Tool and Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* Pads are milled on automotive manifolds in this five-spindle machine. Guides locate the part in the work-holding fixture. Operation is automatic once the starter button is pressed.

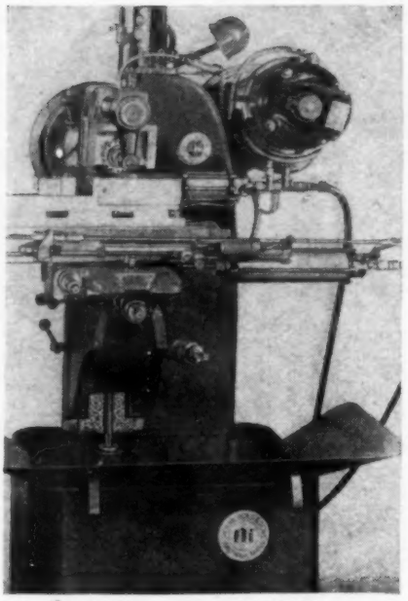
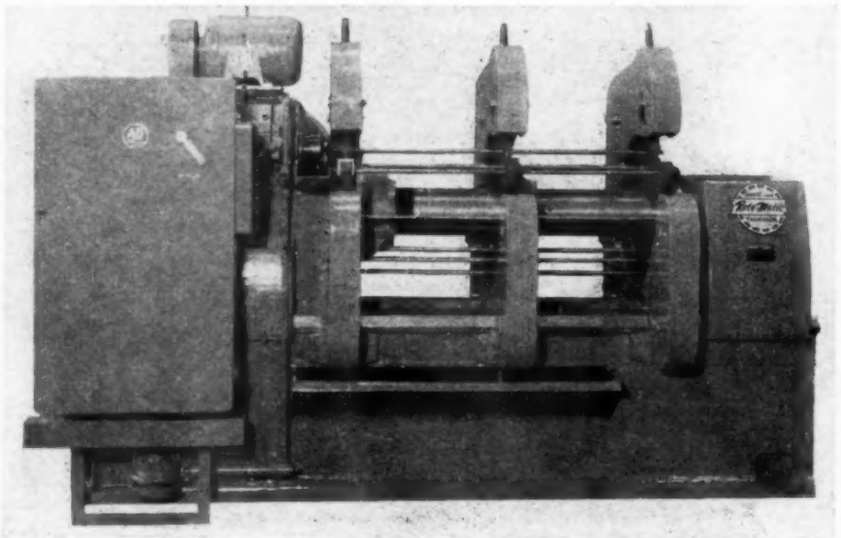
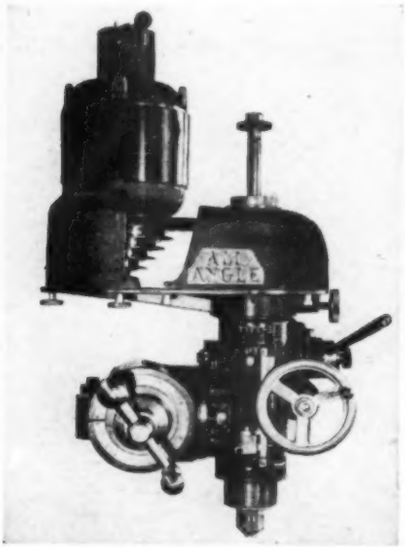


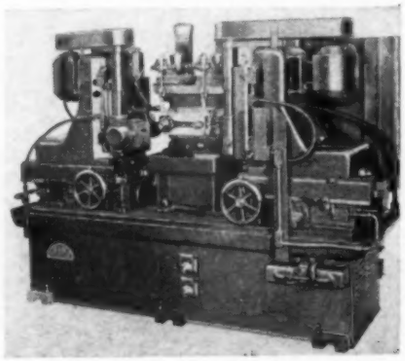
TABLE-FEED ATTACHMENT — *W. H. Nichols & Sons, Waltham, Mass.* A power table-feed attachment for the Nichols miller. It offers rapid approach, maximum proper cutting feed, fast table return and shutoff. Basically, this attachment is a Bellows air-feed unit in conjunction with a Hydro-Check.



SHAFT MILLING—*Davis and Thompson Co., 64 W. Burnham St., Milwaukee 14, Wis.* Index-type special machine for milling and spinning shafts, has 8 stations for rough and finish milling one end of steering shaft and deburring and spinning a rivet head for holding the steering worm.

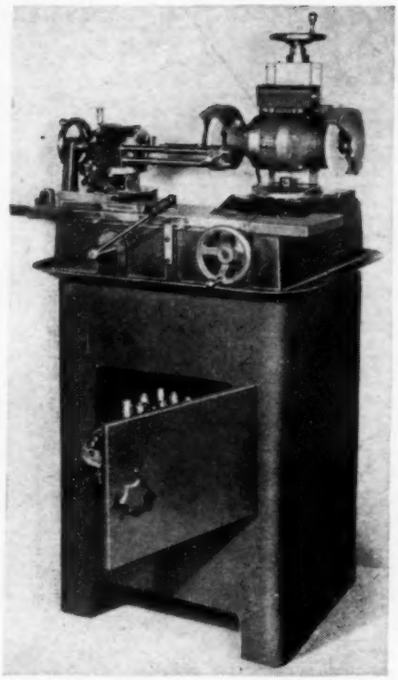


MILLING ATTACHMENTS—*Made by Fray Machine Tool Co., distributed by H. Leach Machinery Co., 387 Charles St., Providence 4, R. I.* The "All-Angle" milling attachment Type 1 weighs 105 lb. and has a ½-hp. motor. The three larger sizes are all of the quill type. Type 2 weighs 115 lb., has a ½-hp. motor and a 3½-in. quill travel. Type 3 weighs 140 lb., has a ¾-hp. motor and has a 3½-in. quill travel. Type 4 weighs 275 lb., has a 1-hp. motor, and 4-in. quill travel.

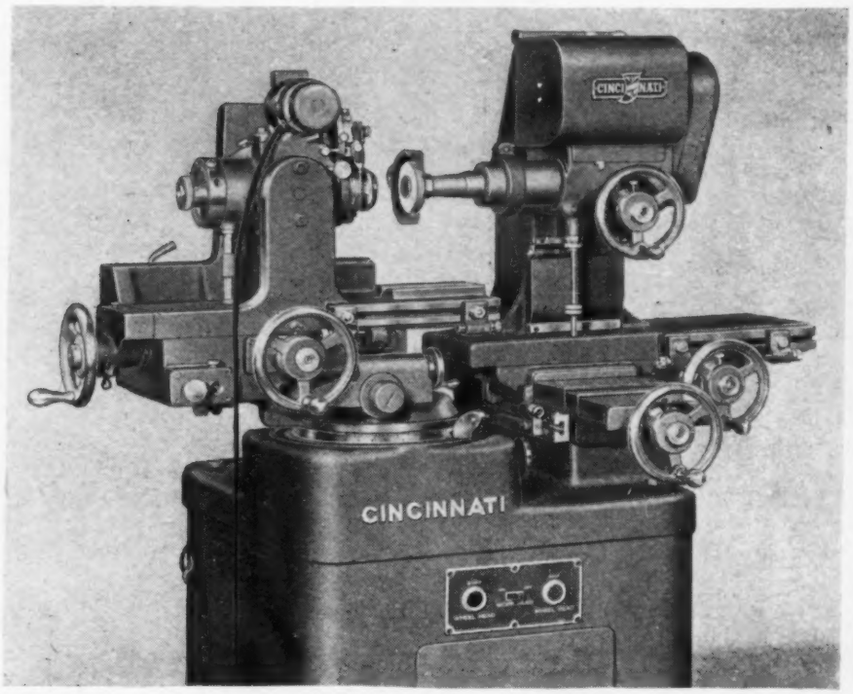


←

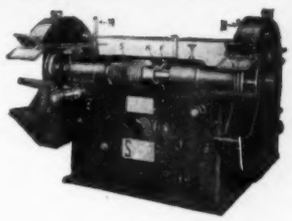
CONNECTING ROD BALANCER—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit 7, Mich.* Special machine for balancing connecting rods weighs the part, mills it for balance. Scales register the amount of overweight. Positive end stops for depth of cut are adjusted by handwheels to correspond with the readings on the two scales. The machine will take a variety of connecting rods varying from 7 to 13 in. in length.

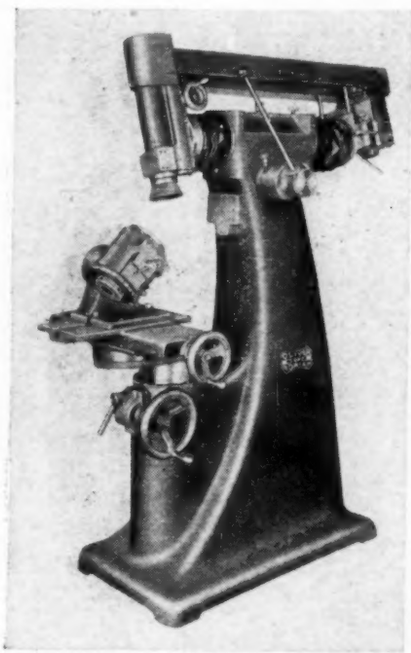


TOOL GRINDER—*D-S Grinder Div., Royal Oak Tool and Machine Co., Royal Oak, Mich.* Tool grinding machine is said to make radial relief grinding easier than regular angular back-off relief grinding. Cam and index plates provide for grinding any tool of one to 12 flutes with identical relief on each blade.



CUTTER AND TOOL GRINDER—*Cincinnati Milling Machine Company, Cincinnati 9, Ohio.* The Monoset is completely redesigned. Cutter shapes involving convex or concave radii, with straight, tapered, or helical teeth, can be resharpened or ground from the solid without the use of special attachments. The workhead may be swiveled through 235° with adjustable stops to limit accurately its arc of travel.

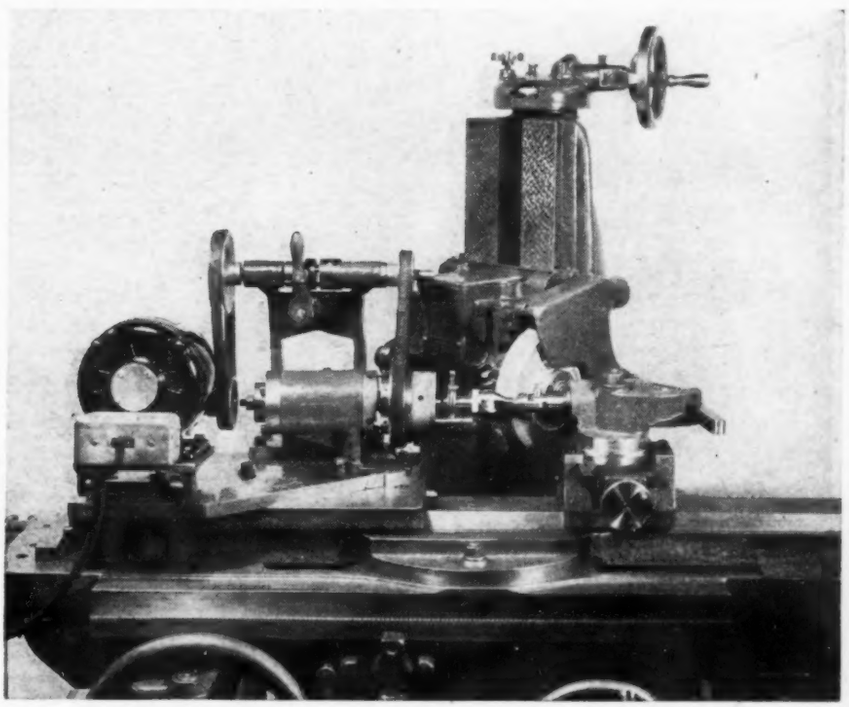


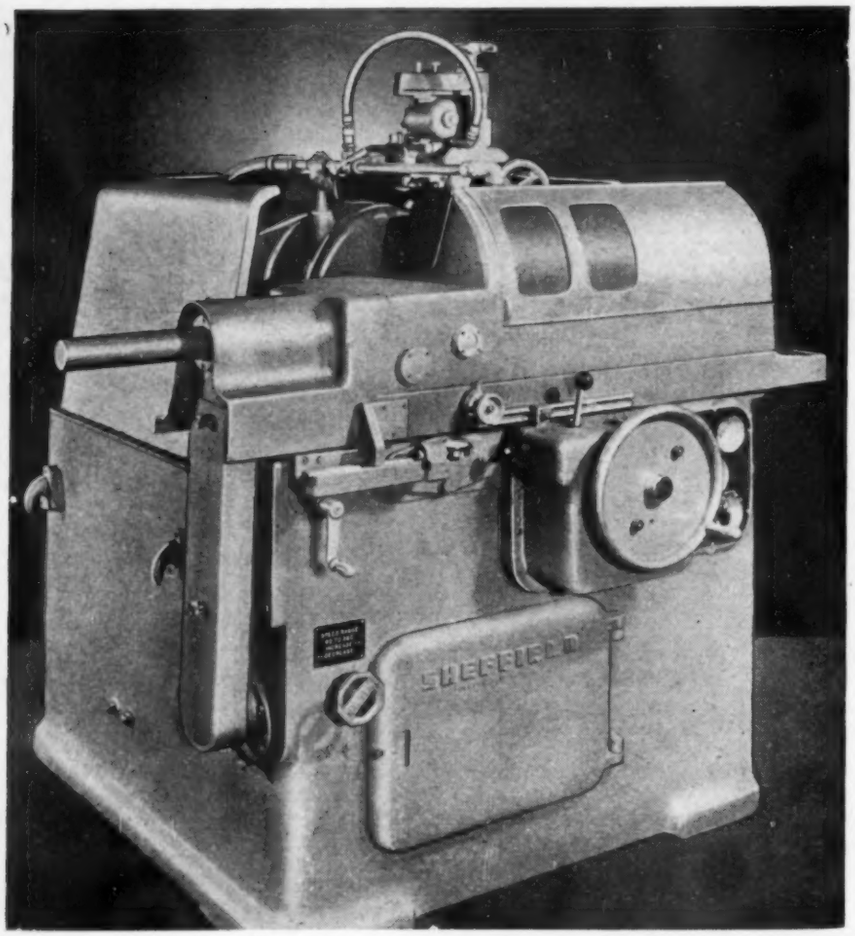


CUTTER GRINDER—*Oliver Instrument Co., Adrian, Mich.* A heavy-duty model of the Ace tool and cutter grinder is essentially the same as the standard model, but has a heavier ram, larger ram bearing, a heavier motor, and a heavier spindle. Designed for gumming and gashing cutters and for grinding cutters tipped with tungsten-carbide it uses the same type of fixtures as the standard model.

RADIAL-RELIEF ATTACHMENT—*Lawson-Leschke Co., 110 East 6th St., Royal Oak, Mich.* With this attachment, it is possible to grind radial relief or forms with a minimum of land or with a sharp edge. The unit consists of a motor-driven headstock with an adapter collet, and a tailstock.

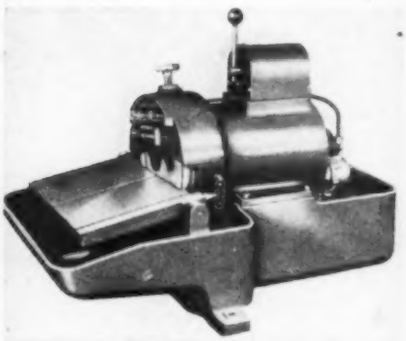
ELECTRICAL GRINDER—*Standard Electrical Tool Co., 2480 W. Sixth St., Cincinnati 4, Ohio.* The No. 30 multiple-speed snagging grinder has been redesigned to handle wheels from 18 to 30 in. Three spindle speeds are provided to maintain grinding efficiency as the wheels reduce in diameter.



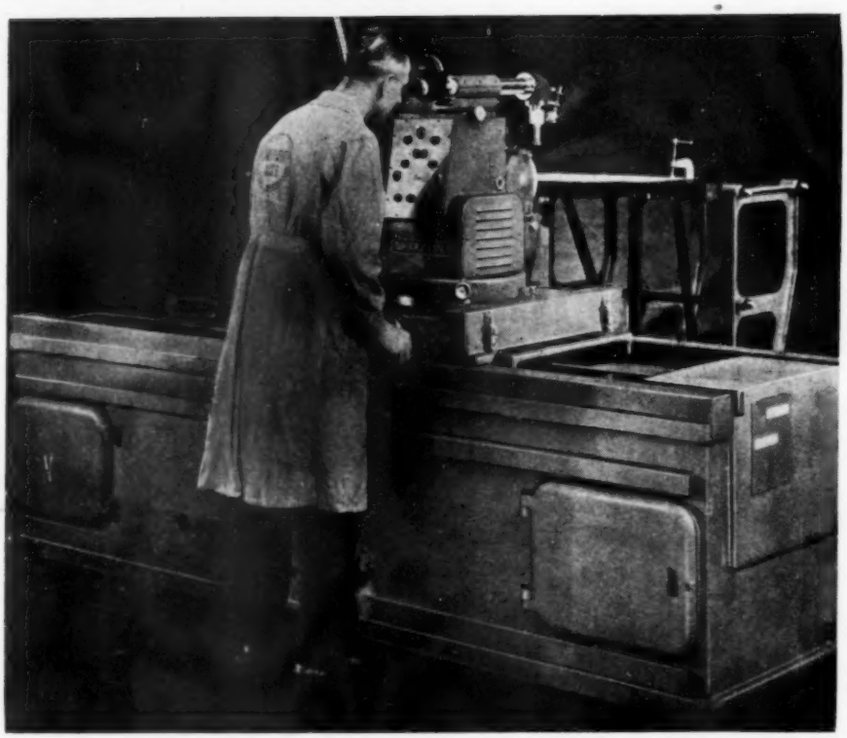


ANNULAR FORM GRINDER—*Sheffield Corp., Dayton, Ohio.* Precision annular form grinder which utilizes the "Crushtrue" principle of wheel dressing is used for the production of annular and cylindrical forms. A variable speed geared-head motor drives the workhead spindle in either direction. Standard work speed range is 60 to 360 rpm.

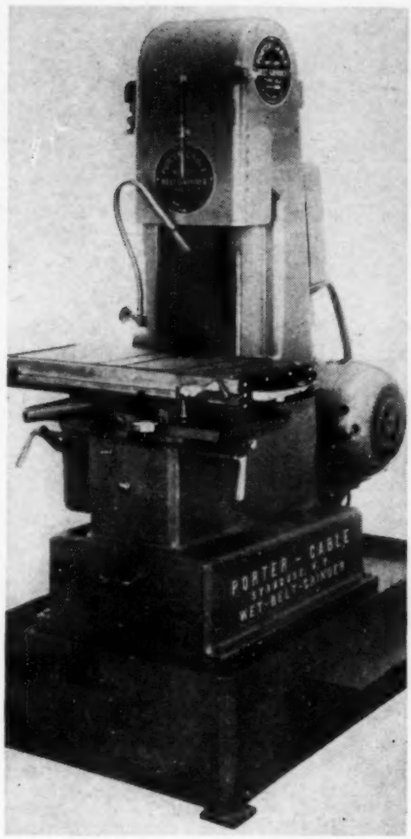
TOOL GRINDERS—*Hammond Machinery Builders, Inc., Kalamazoo 54, Mich.* The 7-in. carbide tool grinder is of heavy-duty construction to permit use of diamond wheels. The tables have screw feed. The Model CB-77 combination chip breaker and diamond finishing grinder accommodates either 6- or 7-in. diameter wheels on the cup wheel side. The table moves in and out by screw feeds.



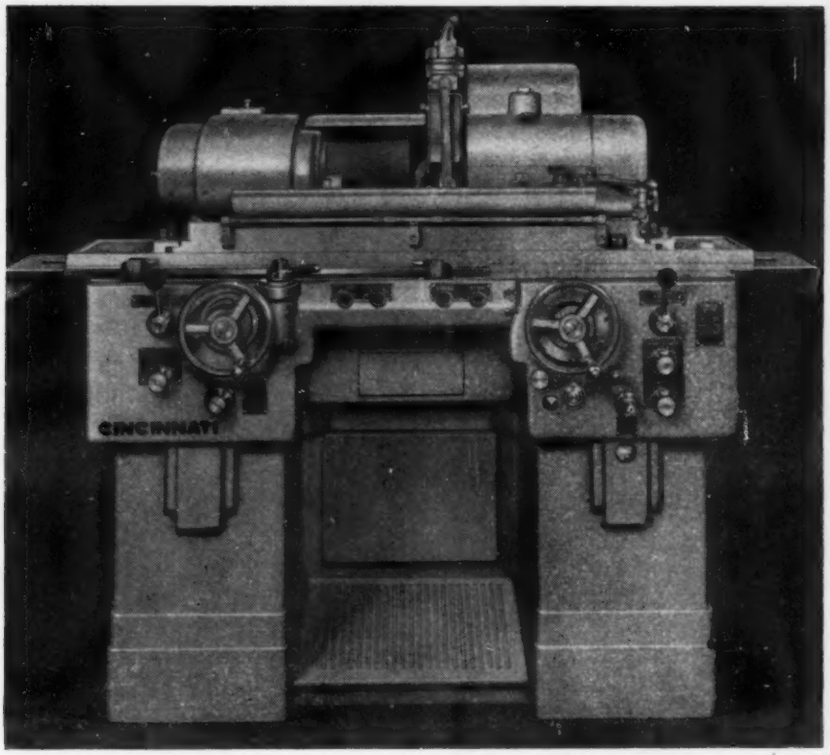
TOOL GRINDER—*The Wickman Corp., 15533 Woodrow Wilson Ave., Detroit 3, Mich.* The Wickman-Neven bench grinding and lapping machine for sharpening carbide tools with a steel-bonded diamond wheel. Power for the steel-bonded diamond wheel is provided by a 1-hp. spindle motor of special design to withstand frequent reversal. The table can be set at any angle from 5° above horizontal to 15° below.



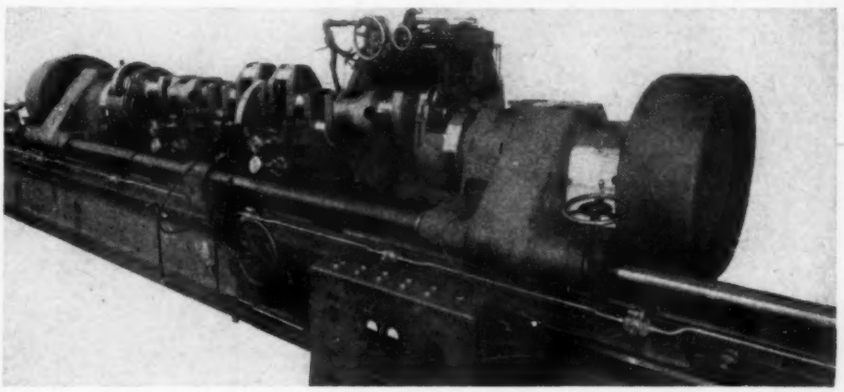
TEMPLET GRINDER — *Sheffield Corp., Dayton, Ohio.* A templet grinder with electronic control of wheelhead axial traverse for the precise grinding of templets and other work up to 72 in. length, 8 in. depth, and 1 in. thick, without re-positioning. The wheelhead may be adjusted on a turret to a maximum of 40° each side of center to meet any requirement for positioning caused by shoulders or other irregularities of the profile.

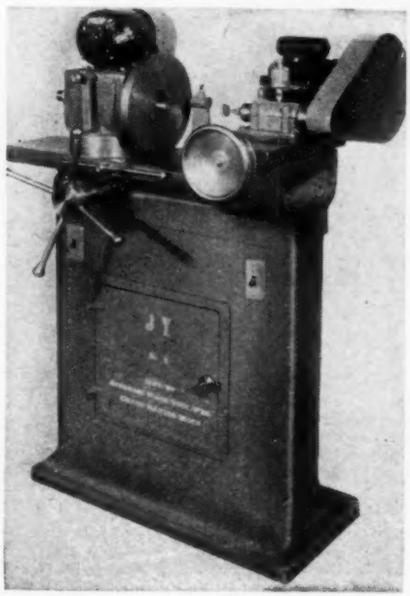


BELT GRINDER—*Porter-Cable Machine Co., Syracuse, N. Y.* Improved wet-belt surfacer, Model BG-8, has a larger recirculating tank. Depth of the machine has been reduced from 62½ to 48 in. The worktable has been lowered from 40¼ to 38 in. from the floor.



GRINDER—*Cincinnati Grinders, Inc., Cincinnati 9, Ohio.* Line of 4-in. plain hydraulic grinding machines, can be provided with "hand" or "automatic" type hydraulic infeed mechanisms. Control location and a kneehole in front of the bed permits the operator to be seated while working. The Filmatic grinding wheel spindle bearings are self-adjusting for load variation.

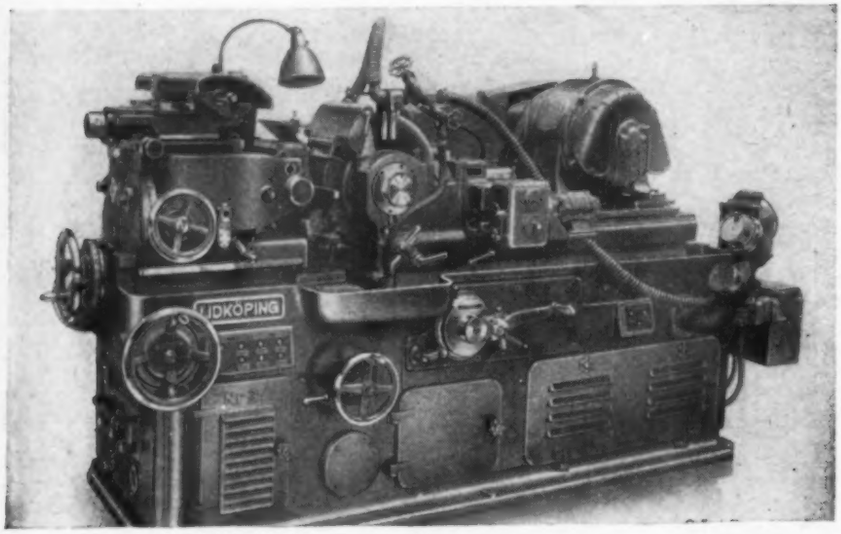




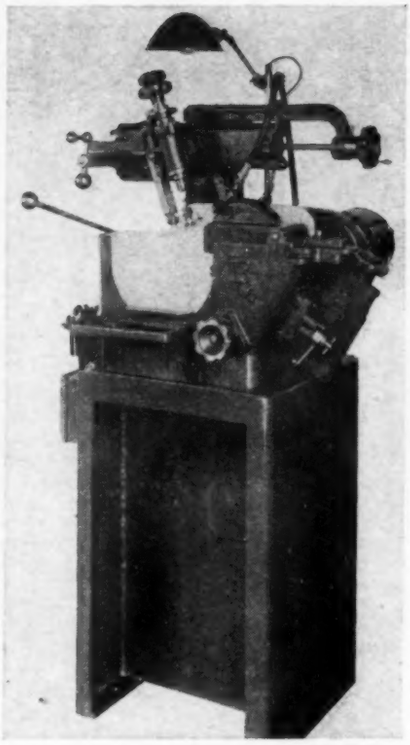
INTERNAL GRINDER — *Superior Machine & Tool Works, 528 Butterworth St., S.W., Grand Rapids, Mich.* The JY-No. 2 will grind sizes from ¼-in. dia. up. Spindle speeds are 12,000 to 27,000 rpm., and workhead speed is 200 to 400 rpm. The machine has a 10½-in. swing with an 11-in. longitudinal travel.

CRANK-PIN GRINDER—*Landis Tool Co., Waynesboro, Pa.* Pins and main bearings of large marine and locomotive diesel-engine crankshafts can be ground accurately on a production basis on 40x216-in. Type B hydraulic crank-pin grinder with workheads and drive designed especially for exceedingly large crankshafts. A dual work-drive arrangement eliminates or minimizes torsion deflection in the crankshaft.

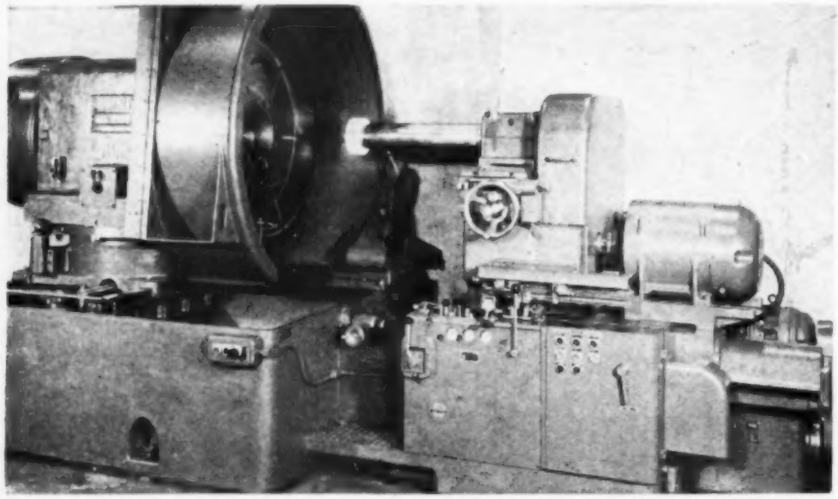
CUTTER, TOOL GRINDER—*Gallmeyer & Livingston Co., Grand Rapids 4, Mich.* No. 60 universal cutter and tool grinder provides for raising and lowering the grinding-wheel head and column and also for the cross feeding of the head and column, so only longitudinal movement is necessary in the subtable and table.



CENTERLESS GRINDERS—*Lidkoping Mekaniska Verkstads A. B., a division of SKF Ball Bearings, Sweden, manufacturer. Triplex Machine Tool Corp., 127 Barclay St., New York 7, N. Y., distributor.* Lidkoping centerless grinders are of heavy construction and have both grinding- and regulating-wheel spindles supported by bearings on both sides. A through-feed speed of 100 fpm. has been obtained in grinding steel shafts.

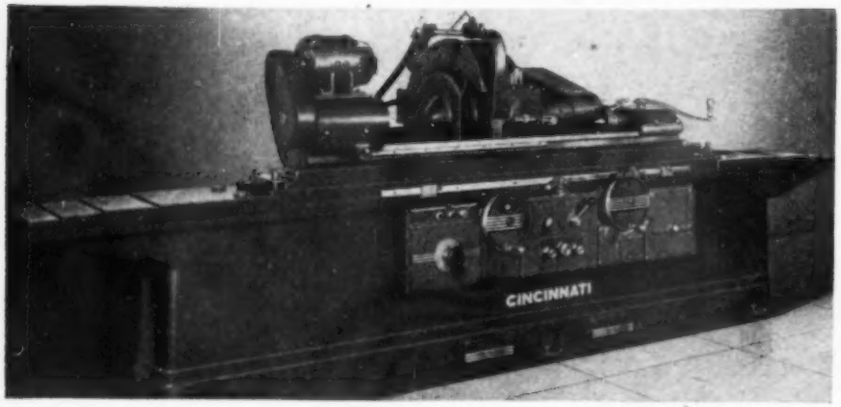


TAP SHARPENER—*Edward Blake Co., 634 Commonwealth Ave., Newton Centre 59, Mass.* Both the spiral point and straight flutes of taps or other straight- or angular-fluted tools can be sharpened with this spiral-point tap sharpener. Right- and left-hand taps up to ⅝-in. diameter with two, three and four flutes can be handled.

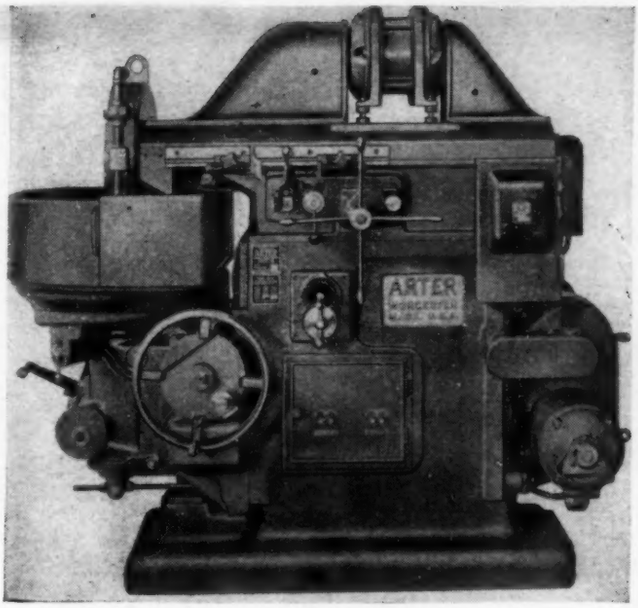


INTERNAL GRINDER — *Bryant Chucking Grinder Co., Springfield, Vt.* Model No. 150, this grinder has total swing of 60 in., a grinding stroke of 14 in., and a maximum traverse stroke of 19 in. Wide angular adjustment of the workhead is possible. The workhead spindle has a 9-in. hole.

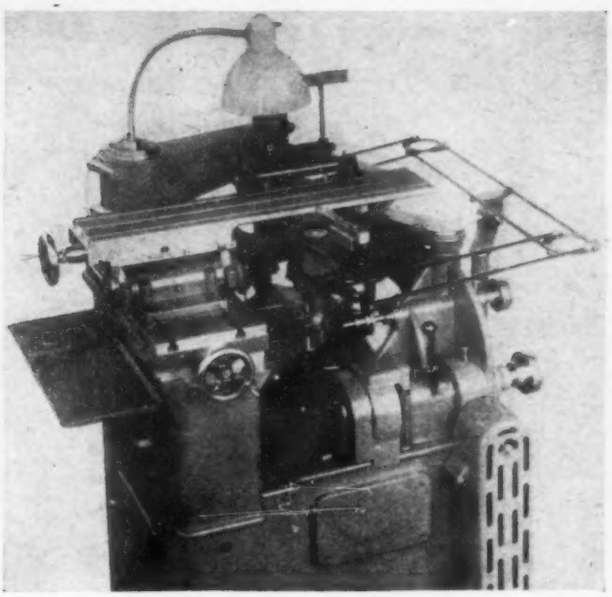
CUTTER & TOOL GRINDER—*Covel Mfg. Co., Benton Harbor, Mich.* The Excell No. 6 universal cutter and tool grinder, designed to sharpen reamers and drilling cutters is adaptable for cylindrical and internal grinding. Longitudinal travel of the table is 14 in., vertical movement of the grinding-wheel spindle 7 in. Cross movement of the saddle is 6½ in. The grinder will swing work of 8-in. dia. and 16 in. long.



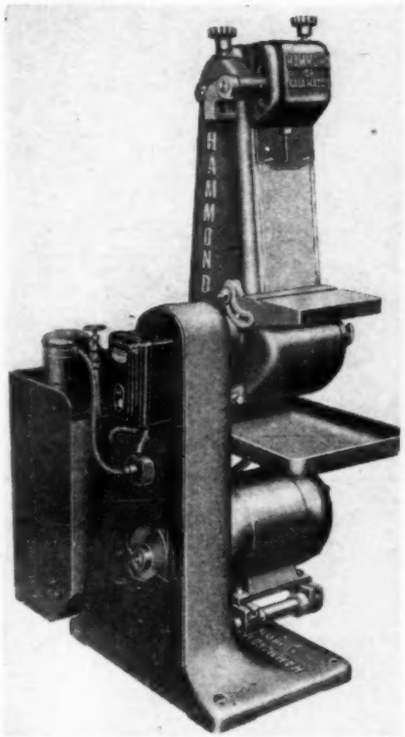
GRINDERS — *Cincinnati Grinders, Inc., Cincinnati 9, Ohio.* Four precision center-type plain grinding machines, 6", 10"-L, 10" and 14"-L, in which sizes followed by letter L are light types, built in the same lengths as the sizes immediately preceding them, but with extra swing capacity. The same features are incorporated in all four sizes.



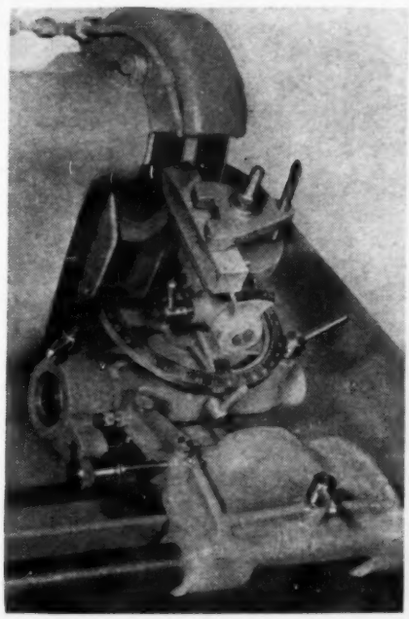
SURFACE GRINDER—*Arter Grinding Machine Co., Worcester, Mass.* A rotary surface grinder, Model D, in 12- and 16-in. sizes, has the wheel spindle positioned in the slide, so its axis is in the same horizontal plane as the wheel-slide ways. The work-spindle housing can be tilted for grinding interior or exterior conical surfaces on circular work.



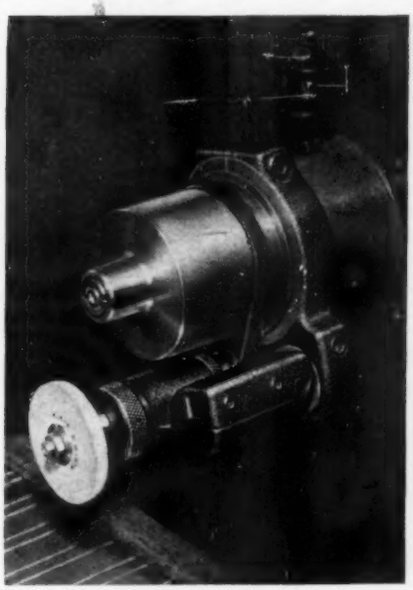
PROFILE GRINDER—*Cosa Corp., 405 Lexington Ave., New York 17, N. Y.* Fritz Studer type PSM precision profile grinding machine is designed for grinding profiles of hardened work pieces such as profile gages, form tools, and sectional dies. Flat workpieces of 2-in. thickness and 5.9-in. length and circular work of 4-in. diameter can be ground. Grinding is to an accuracy of 0.0002.



ABRASIVE BELT GRINDERS — *Hammond Machinery Builders, Inc., 1600 Douglas Ave., Kalamazoo 54, Mich.* Model VH-6 uses an abrasive belt 6 x 60-in. for wet or dry grinding. The belt can be changed from vertical to horizontal operation by loosening one capscrew in the top of the base. Model 5 is available as a floor or bench model in a variety of combinations. It can be equipped with one or two abrasive belts to 3 in. in width. Model F-2 has a 48-in. belt 2 in. wide.



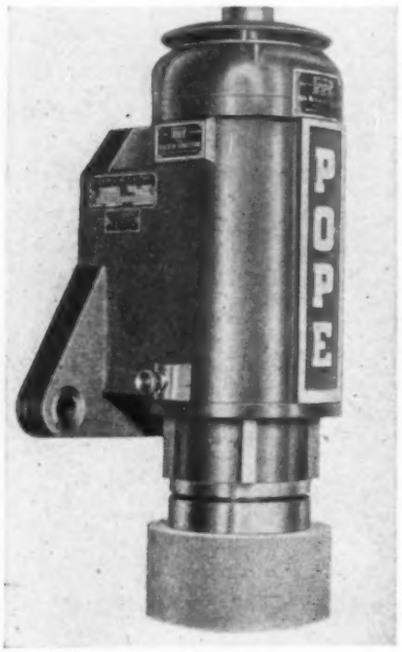
CARBIDE TOOL GRINDER—*E. F. Hager & Son, 98-02 217th Lane, Queens Village 9, N. Y.* Tool grinder has reciprocating action built into the toolholder independent of the shaft on which the holder slides from rough to finish wheel. A line of attachments enables the tool grinder to be used for milling cutters, counterbores, inserted tooth face mills, spiral reamers, end mills, and other carbide-tipped tools.



SURFACE GRINDER ATTACHMENT—*D. & S. Model Co., 3114-16 E. 3rd St., Dayton 3, Ohio.* Stafford "Blitzrev," attachment for surface grinders permits the use of small grinding wheels. Wheels from ⅛-in. mounted quills to 3-in. dia. can be used. Speeds of 10,000 and 15,000 rpm. are available with the standard 2-step pulley.

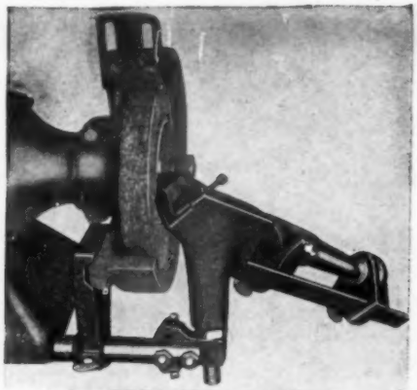
GRINDING FIXTURE—*Govro-Nelson Co., 1931 Antoinette, Detroit 8, Mich.* An axial-relief grinding fixture for a wide range of operations can be quickly converted from right- to left-hand. Used on surface or cutter grinders, the fixture is adapted to grinding cutting edges, steps, flutes and chip ←relief.

DISK GRINDER—*Kindt-Collins Co., 12651 Elmwood Ave., Cleveland 11, Ohio.* This 24-in. disk grinder is adaptable to grinding metal, wood or plastics. Specific disk speeds required for grinding these materials are available. Table tilts 45° down and 25° up by worm and gear drive.

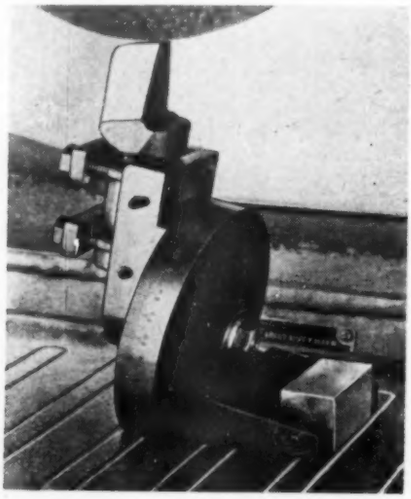


VERTICAL MOTORIZED SPINDLE —*Pope Machinery Corp., 261 River St., Haverhill, Mass.* Vertical motorized spindle for use on surface grinders and other machines is equipped with a fan-cooled, totally inclosed motor of 3, 5, or 10 hp., operating at 1200, 1800, or 3600 rpm. The spindle is designed to rough off surplus material fast and for precision finish grinding.

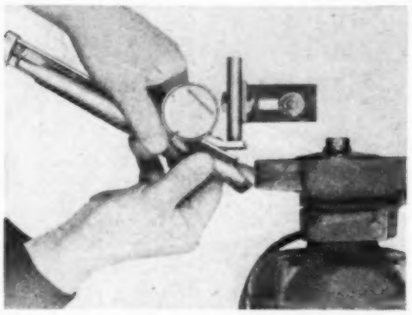
GRINDER ATTACHMENT — *Grenby Mfg. Co., Whiting St., Plainville, Conn.* The Low Micro Finish attachment can be installed directly on the internal grinders in series 103 but must be used with a complete head including the attachment on the external grinders. Internal or external work can be finished with the attachments, with separate holders being used to hold the internal and external stones.



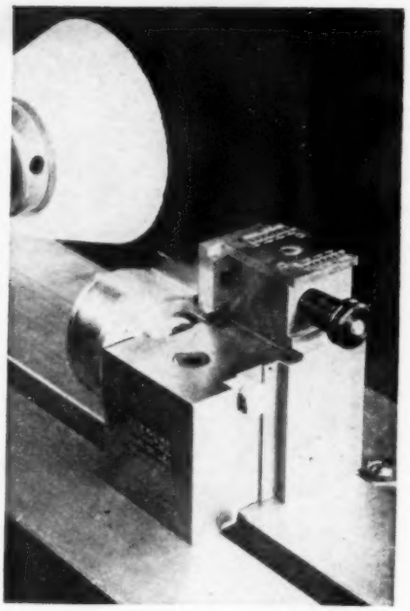
GRINDING FIXTURE — *Industrial Mfg. Co., 1900 Euclid Ave., Cleveland, Ohio.* Ind-L-Way drill-grinding fixtures in two models are for sharpening drills from ¼ to 2⅞ in. in dia. and up to 26 in. in length. They are made especially for use with Black & Decker and Van Dorn bench and pedestal grinders, but can be applied to grinders of other makes.



TOOL-GRINDING FIXTURE — *George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* All-Purpose tool grinding fixture is placed on the magnetic chuck of a surface grinder. It is graduated by degrees up to 90, left and right. The rake angle is ground by means of a tipping block. 3, 5, 7 or 10° clearance may be obtained by turning the block to the desired side.



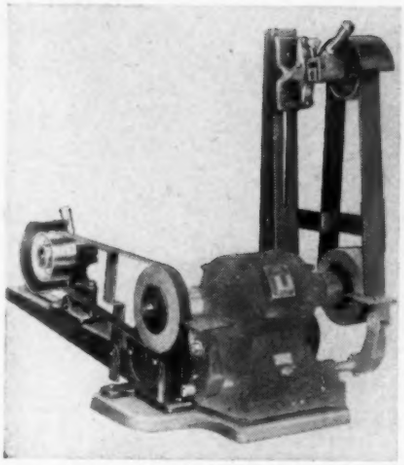
DRILL SHARPENER—*Majestic Drill Sharpener, 1100 Second Ave., S., Minneapolis 2, Minn.* Turning the calibrated dial sets this sharpener so that both cutting edges and both angles of drill will be ground exactly alike. Takes drills from 5/32 to 1 in., with either straight or No. 2 taper shank.



SHARPENING AND CHECKING FIXTURE—*Hardinge Brothers, Inc., Elmira, N. Y.* Sharpening and checking fixture for circular form tools can be supplied to the table of any standard tool grinder. The tool is sharpened and the sharpening is checked without removing the tool from the fixture.

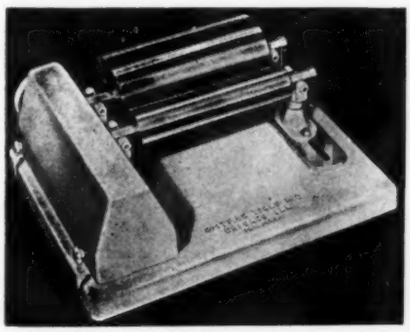
HONING MACHINE—*Staple Engineering Co., 1315 S. Woodward Ave., Birmingham, Mich.* The Model B6 honing machine will hone parts ¼- to 2½-in. inside diameter and has a 7-in. stroke. The honing cycle is adjustable from 3 to 180 sec. Any speed from 40 to 180 strokes per min. can be obtained.

SHARPENING FIXTURE — *Motor Tool Mfg. Co., Detroit, Mich.* A fixture for sharpening milled-type, steep-spiral, ground-form milling cutters, is adaptable to No. 2 Cincinnati cutter grinders, but will be equipped with brackets to fit other cutter grinders of recent manufacture. A hardened and accurately ground cylindrical duplicating roll transfers the exact form of this roll to the cutting edge of the tool.

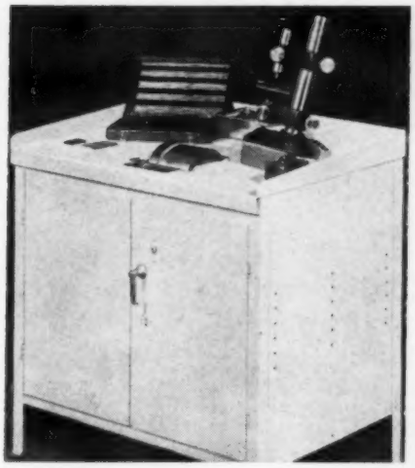


GRINDING ATTACHMENT—*Porter-Cable Machine Co., Syracuse, N. Y.* A light, narrow-belt grinder attachment, Type N-2, is designed for light grinding. The attachment is furnished without motor and is attached to the familiar bench-type wheel grinder.

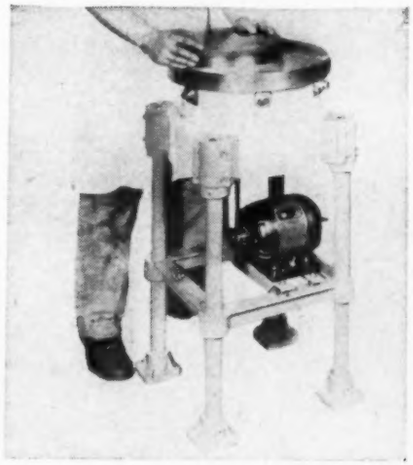
CUTTER SHARPENER ATTACHMENT—*Edward Blake Co., 634 Commonwealth Ave., Newton Centre, Mass.* An Angle-True attachment, for the Waltham cutter sharpener, provides a second diamond for dressing the back and periphery of the wheel to any desired combination of angles.



ROLLER LAP MACHINE—*Spitfire Tools Inc., 2930 N. Pulaski Rd., Chicago 41, Ill.* Roller lapping machine consists of two precision-ground cast-iron rollers which revolve in self-aligning bearings. Both rollers rotate in the same direction. They accommodate work up to 6 in. in dia.



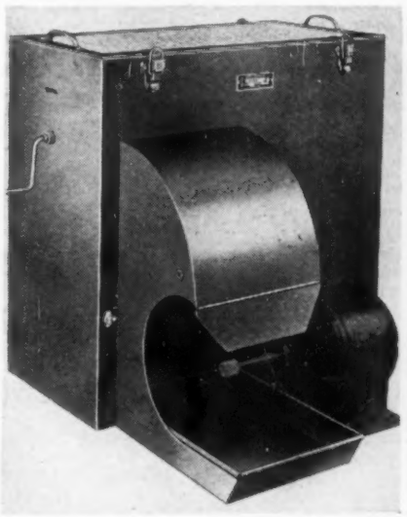
CENTERLESS LAPPING MACHINE—*Size Control Co., Div. American Machine & Gage Co., 4636 W. Fulton St., Chicago 44, Ill.* The Model 100 centerless lapping machine obtains a precision finish of less than 2 microinches. The machine has a ½-hp. motor and vibrationless drive built in.



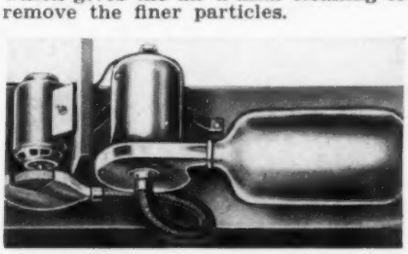
FLAT LAPPING MACHINE—*Spitfire Tools, Inc., 2933 N. Pulaski Rd., Chicago 41, Ill.* Single pieces ordinarily require no holders, with the operator laying the piece on the revolving circular lapping plate and directing its motion with his hands.

LAPPING PLATES—*Tatra Tool Co., 16317 Sanford Ave., Cleveland, Ohio.* Super-Speed lapping plates with diamond or square charge patterns. The plates are suitable for diamond-charged and wet-lapping operations. Surface tolerance is held to 0.0005 in.

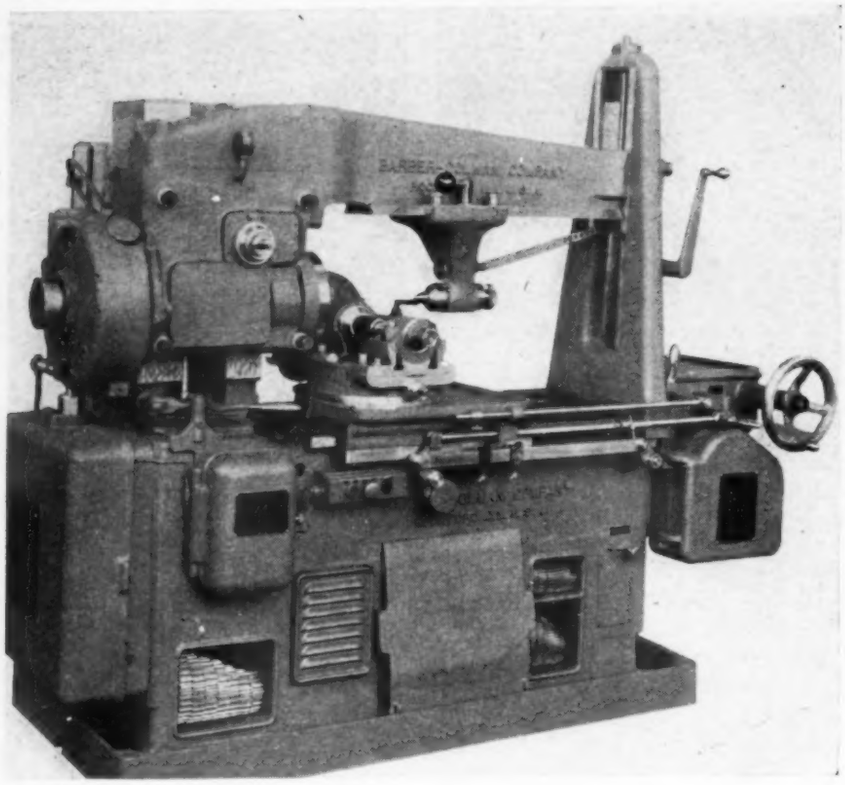
DUST COLLECTOR — *Aget-Detroit Co., First National Bldg., Ann Arbor, Mich.* Several improvements have been made in the Model 1150 Dustkop dust collector. A high compression filter, a new filter seal, and cyclone stack deflector have been added. The changes are designed to meet the dust loads encountered in production buffing and polishing work.



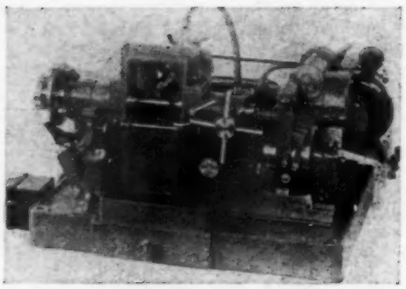
PORTABLE DUST COLLECTOR—*Aget-Detroit Co., 602 First National Bldg., Ann Arbor, Mich.* The Model 421 has two stages of air cleaning. The first stage removes the heavier dust and dirt with a cyclone separator. The second stage is a spun-glass filter which gives the air a final cleaning to remove the finer particles.



DUST COLLECTORS—*Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40, Ill.* Model 27 Tornado is equipped with a 1/5 hp. motor. Suction produced is said to catch all suspended dust particles thrown off by the grinding wheel.



HOBBING MACHINE — *Barber-Colman Co., Rockford, Ill.* Type A hobbing machine now has heavy-duty work and hob slides, making it possible to operate with higher feeds and speeds. An improved method of mounting the index worm in the worm-gear case includes top and bottom ball bearings which rigidly support the worm independent of the main index drive shaft.

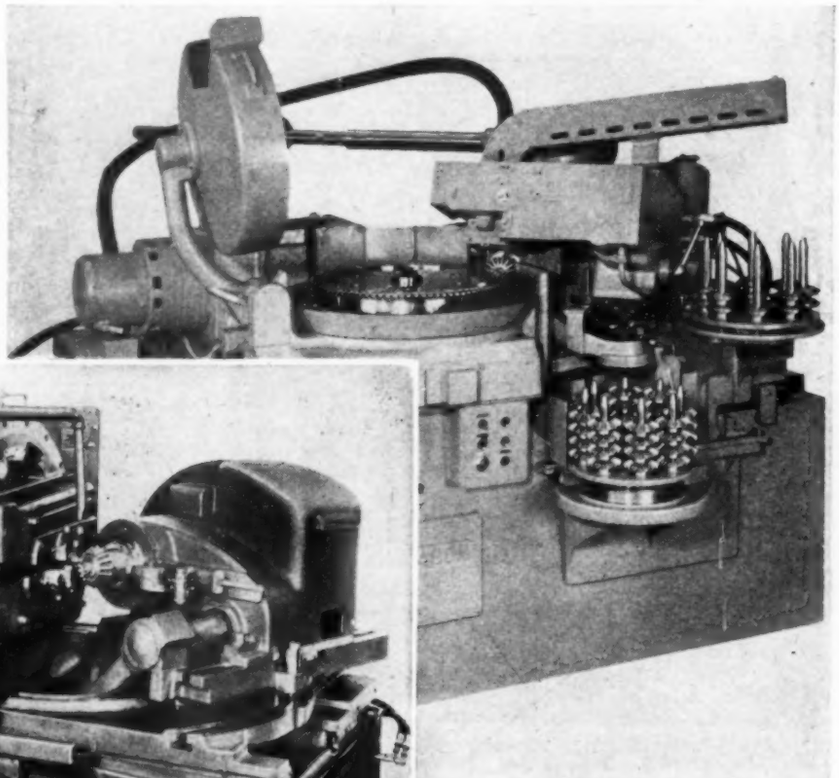


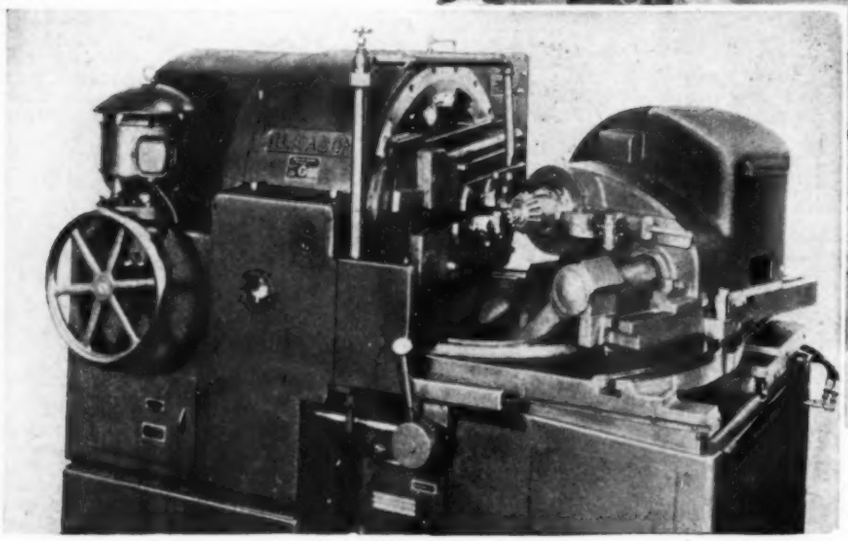
GEAR CUTTER—*Waltham Machine Works, Waltham, Mass.* Medium-size pinion and gear-cutting machine with a capacity up to 2¼-in. pitch diameter and 2-in. length of cut is a single cutter machine, with the revolving cutter making successive cuts on blanks held and indexed by the work spindle and supported by the tail center. Only straight pieces can be cut.

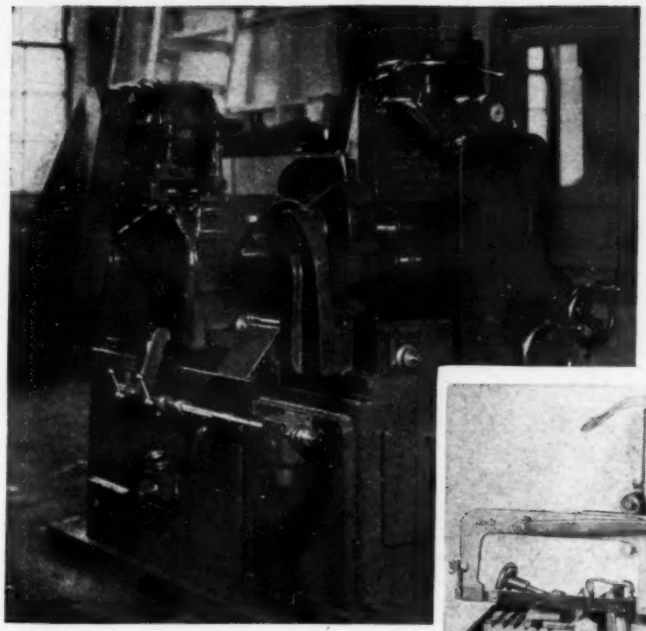
SAW—*Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio.* No. 00 metal cut-off saw, that can be equipped with automatic cycling to both work and feed, cuts ferrous bars up to 1¼ in., non-ferrous bars up to 2 in., and tubing or shaped pieces up to 2½ in.

GEAR GENERATOR — *Gleason Works, 1000 University Ave., Rochester 3, N. Y.* A machine for cutting straight bevel gears with conjugate tooth surfaces, No. 8 Revacycle, is intended for quantity production. The Revacycle process is a method completely generating straight bevel gear teeth in one cut from the solid metal. A large diameter, disk-type cutter is used. The cutter rotates in the horizontal plane at a uniform rate. ↓

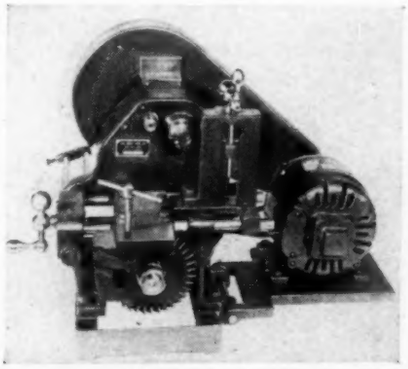
STRAIGHT BEVEL GENERATOR—*Gleason Works, 100 University Ave., Rochester 3, N. Y.* The 12-in. B model straight bevel gear generator handles gears up to 24-in. pitch diameter, 3½-in. face length, and 3 diametrical pitch. The same basic features are incorporated in the No. 24 straight bevel generator for cutting large gears. The latter can handle gears up to 35½ in. pitch diameter, and 1½ diametrical pitch in large or small quantities. The machines employ two side-cutting tools which operate alternately on opposite sides of the gear tooth being cut. It is possible to obtain a localized tooth bearing. ↓



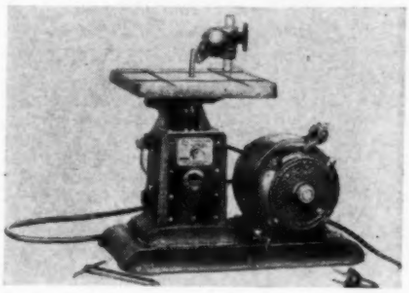




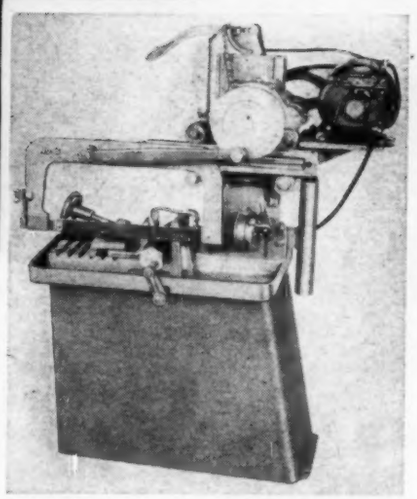
METAL-SAWING MACHINE—*Motch & Merryweather, Cleveland, Ohio.* No. 2 hydraulic feed and hydraulic clamping metal-sawing machine cuts ferrous and non-ferrous metals up to 6 in. round, square or multiple stock, or up to 12 x 5 in. standard L-beams.



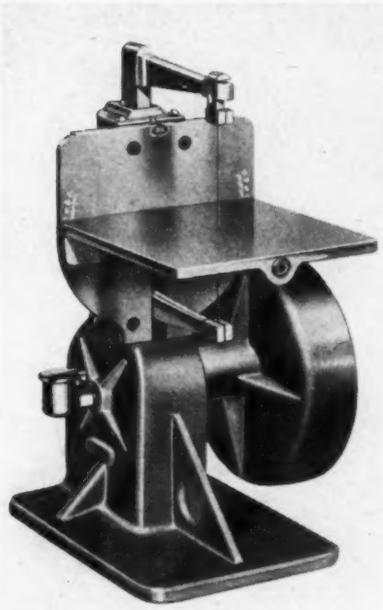
CUT-OFF MACHINE—*Grove Mfg. Co., Dayton 7, Ohio.* For cutting off bars to close tolerances with smooth mill-finished ends, a two-speed cut-off and keyway milling machine is equipped with a stop for cutting stock to any set length. The machine can be used to mill flat, straight keyways, or Woodruff keyways in bars to 1-in. dia.



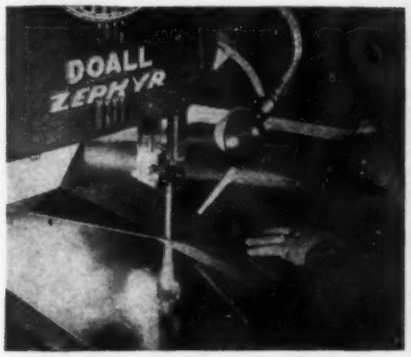
DIE-FILING MACHINE—*All American Tool & Mfg. Co., 1014 W. Fullerton Ave., Chicago 14, Ill.* Precision die-filing machine for filing, honing, and sawing operations. A universal-joint clamping arrangement is employed to assure vertical positioning of the file or other tool, even though the shank is warped or twisted.



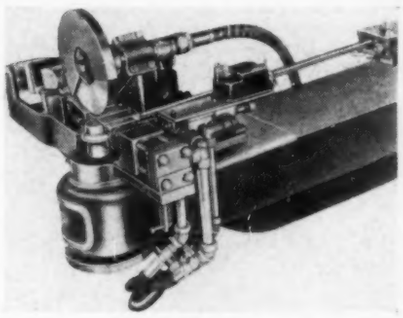
HACK SAW—*T & S Engineering Co., 15 N. Euclid Ave., Pasadena 1, Calif.* The Rodgers power hack saw is now known as the Standard Hi-Speed power hack saw, and is produced in No. 3 floor model with a 6x6-in., No. 2 bench model with 4x4-in. capacity.



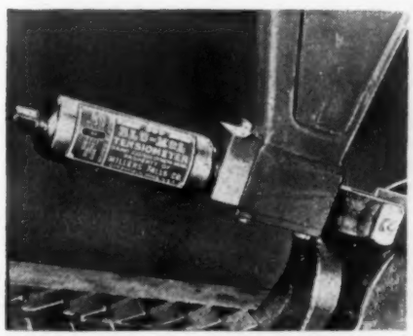
SMALL SAW—*L/B Mfg. Co., Box 8281, Market Station, Los Angeles 21, Calif.* A saw and filing unit for die work, the "Mity-Migit" has body of the machine made of aluminum castings. The blade is tensioned positively without the use of springs. The table can be tilted 15°.



SAW—*The DoAll Co., 1301 Washington Ave. S., Minneapolis 4, Minn.* Zephyr 16 has a 16-in. throat depth and 10-in. thickness capacity. With variable speed range from 1000 to 5000 fpm., it is designed especially for cutting non-ferrous metals, wood and plastics.

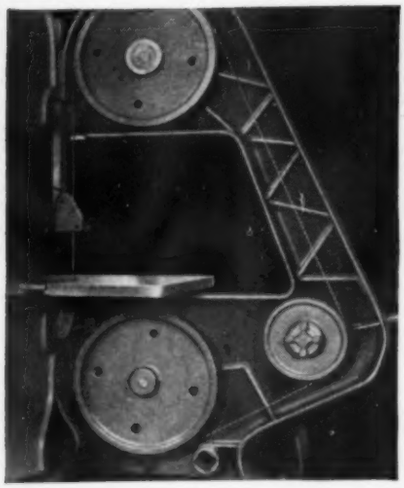


CUTOFF ATTACHMENT—*Pines Engineering Co., Aurora, Ill.* Automatic cutoff for all sizes of Pines automatic tube and pipe benders which handle tubing from ¾ to 5 in. O.D. and pipe up to 4 in. O.D. After the machine finishes the bend, the mandrel is extracted and, before the clamps are opened, the saw is passed through the tube by hydraulic power.

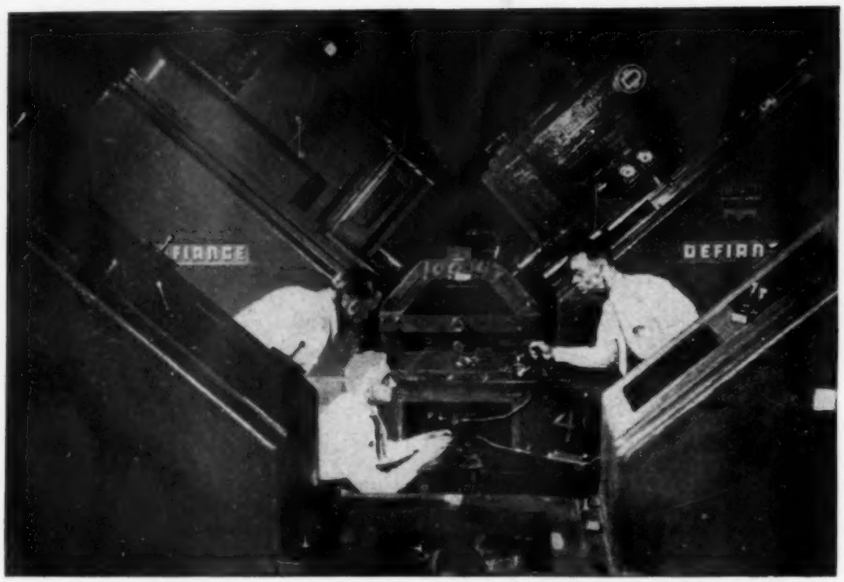


HACKSAW BLADE TENSION—*Millers Falls Co., Greenfield, Mass.* "Tensiometer" designed to set and maintain correct blade tension on power hacksaws is a small cylinder, inclosing a strong, calibrated spiral spring. Desired tension from 0 to 4000 lb. can be obtained.

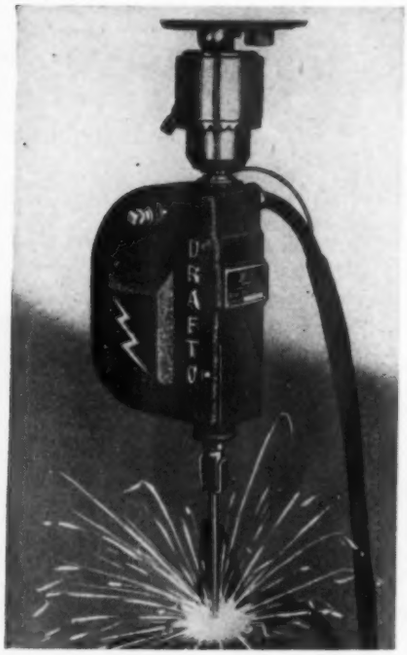
HOBBING ATTACHMENT—*James Coulter Machine Co., Bridgeport, Conn.* Tap threads can be produced on the Type H hob-thread milling machine, with the aid of a new relieving attachment. Taps with any number of flutes with eccentric or concentric relief can be produced. One revolution of the relieving cam generates one flute on either straight or taper taps.



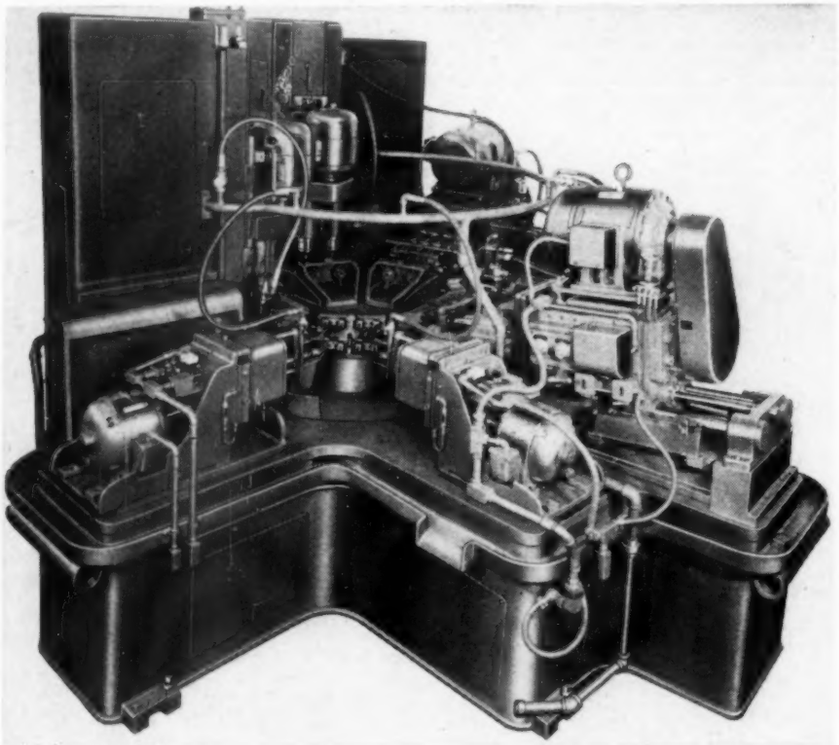
BANDSAW—*Ermac Co., 5531 S. Vermont Ave., Los Angeles 37, Calif.* The Cerny bandsaw with 12 speeds from 85 to 1750 fpm. has throat depth of 17½ in. and distance from table to guide of 10½ in. The 20 x 20-in. table will tilt to 45°.



SPECIAL MACHINES—*Defiance Machine Works, Inc., Defiance, Ohio.* Valve holes and inserts in V-type engines are machined on a series of eight machines, which are No. 37 hydraulic units mounted in pairs on columns with the proper angle for machining the valve holes.

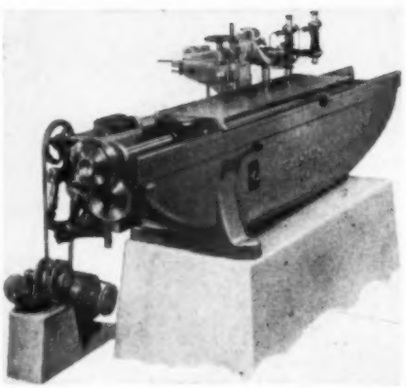


DISINTEGRATOR — *Drafto Corp., Cochranton, Pa.* Model 3 metal disintegrator works on the electrical sputtering principle, and is suitable for drilling hard metals. It will remove broken drills or taps from work, without in any way injuring the metal of the workpiece, regardless of the hardness of the metal. Bores through hardened high-speed steel at the rate of about 1/16 in. per minute.



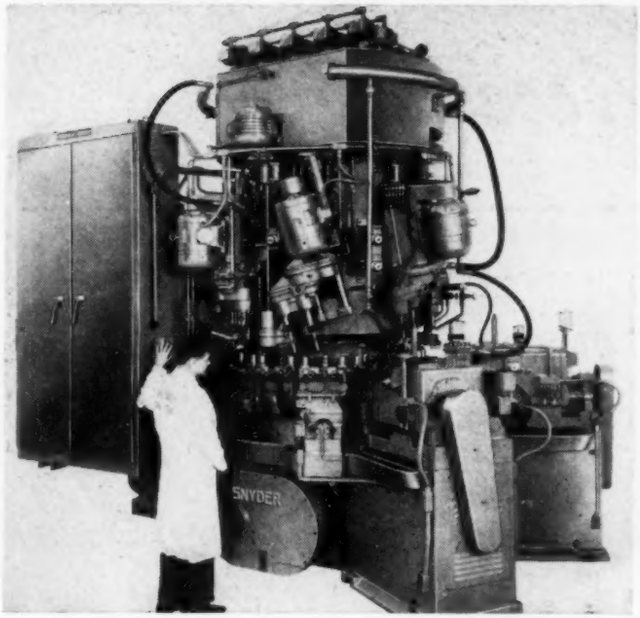
LINEAR DIVIDERS—*Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.* Automatic linear dividing machines automatically rule highly accurate linear scales of practically any pattern or spacing and are designed for precision ruling at production speeds. The largest model will rule a continuous scale up to 40-in. long at a rate of 60 or more lines per min. with a rated accuracy of ±0.0001 inch.

→

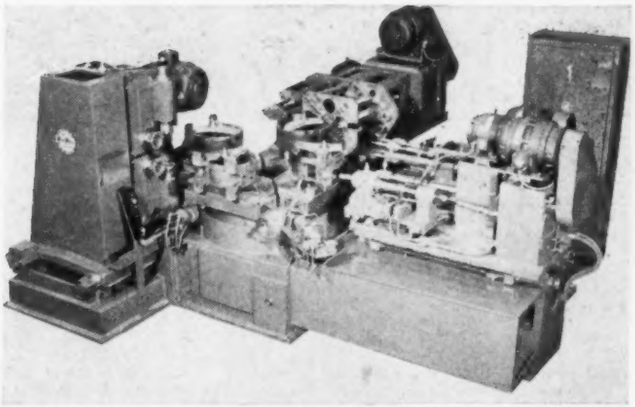


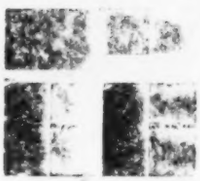
STEERING KNUCKLE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit 7, Mich.* Each fixture on this seven-station machine clamps a left- and right-steering knuckle. Operations performed are drilling, reaming, tapping, and two-way rough and finish boring, as the parts progress around the machine.

CUTTING-SPEED CALCULATOR—*Lawrence Engineering Service, 86 Snyder Ave., Peru, Ind.* Cutting-speed calculator which is used like a slide rule has three diameter scales graduated in inches, millimeters, and number and letter drill sizes. The desired spindle speed for any given diameter and surface speed can be determined.

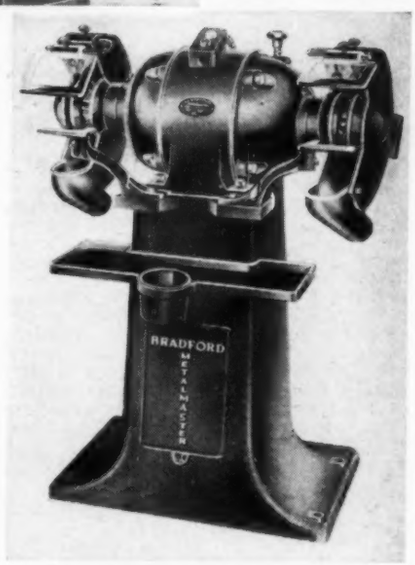


CONNECTING ROD MACHINE — *Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* Automotive connecting rods are completely machined except for the bearing cap joint faces and crank and wrist pin holes in this special machine. Dual work-holding fixtures are mounted on a 12-station Geneva index table. Production at 80% of rated efficiency is 266 rods per hour.

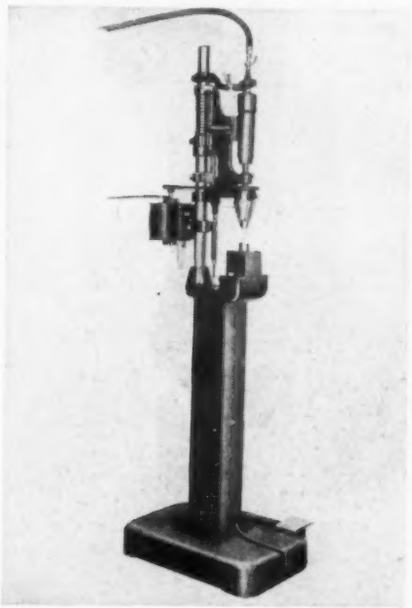




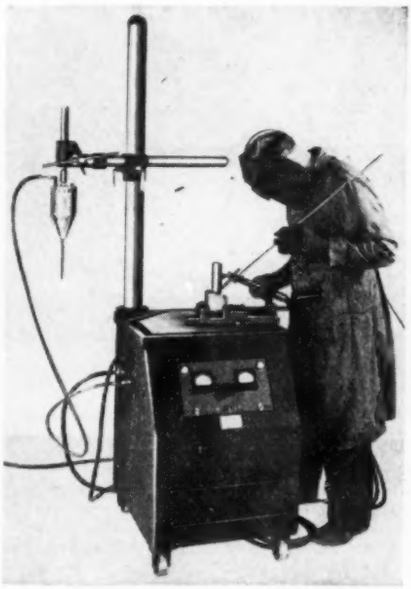
SPECIAL MACHINE — *Davis & Thompson Co., Milwaukee 1½, Wis.* Milling, drilling and tapping operations in a four-station indexing machine are performed simultaneously on electric motor frames. Interchangeable fixture and drill plates make it possible to change over from one size motor frame to another in a short time, 12 sizes being handled.



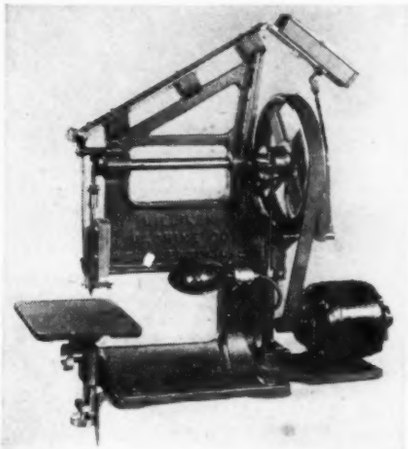
ELECTRICAL TOOLS—*Bradford Machine Tool Co., Electrical Tool Division, Dept. 1A, Evans St., Cincinnati 4, Ohio.* Metal Master line includes lathe grinders, automotive equipment, disk sanders, adjustable-speed snagging grinders, adjustable-speed polishers, and nut runners. Illustrated is the Metal Master grinder.



RIVETER—*Schlack Mfg. Co., 13255 Birwood Ave., Detroit 4, Mich.* The Model PS Pneu-Spin riveter has been improved to provide four interchangeable heads. The head capacities based on solid soft steel rivets are size 62, 3/32-in. capacity; size 75, 5/32 in; size 100, ¼ in.; and size 125, 5/16 in.



DISINTEGRATOR—*Clinton Machine Co., Clinton, Mich.* Thomas Metal Master can be used for metal disintegration, arc welding, brazing, soldering, drill pulling, air extraction, metal etching and demagnetizing. The arc-welding unit provides 100 amp. for 30-min. runs, up to 200 amp. for intermittent runs, with 8 heat stages, and uses up to 3/16-in. welding rods.

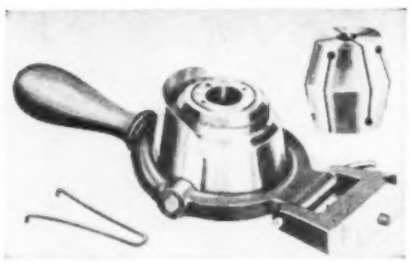


←

NAILING MACHINE—*Milliken Machine Co., Hastings Sales Engineering Div., Boston, Mass.* Precision nailing or pinning machine replaces hand assembly operations where small nails, pins, rivets, or drive screws are employed. Nails can be angled, countersunk or partially inserted. The sustained driving action allows a nail to pierce aluminum, copper, zinc, lead, tin, thin sheet steel, and various plastic compositions without predrilling.

Tools and Accessories

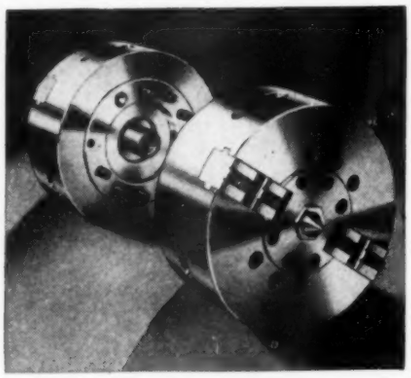
COLLET CHUCK—*Goodwin Mfg. Co., 1743 Second Ave., Cuyahoga Falls, Ohio.* Collet chuck controlled by a short lever requires only fingertip force to open or close the collet. The threaded nose cap can be removed for changing collets or turned to adjust collet gripping pressure.



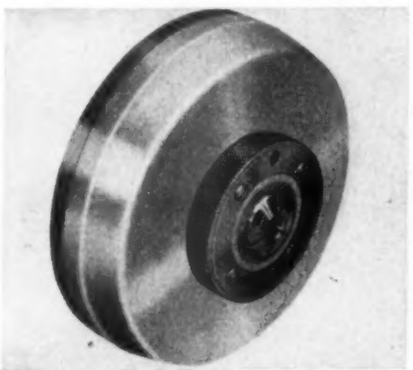
COLLET CHUCK—*Micro Parts Co., Dept. AM, 322½ East Beach Ave., Inglewood, Calif.* Miracle Collet Chuck can be used with stock up to 1 in. The chuck extends 1½ in. beyond the spindle nose of the lathe.

BOX-BODY CHUCKS—*Skinner Chuck Co., 344 Church St., New Britain, Conn.* Production has been resumed on the Series 1400 and 1400-A box-body chucks, self centering and power operated. Production had been discontinued during the war. Present production is in the 9-in. rated size only.

STEP CHUCKS—*Gilbert-Baker-Midlam Co., 38 N. Jefferson St., Dayton 2, Ohio.* Special step chuck and closer combination for 6-in. and 10-in. Atlas, 9-in. South Bend, 10-in. Logan and 12-in. Clausing lathes has a closing sleeve threaded for the spindle of the lathe. The chuck head is unhardened so that it can be bored with a series of steps to fit any work to be held.

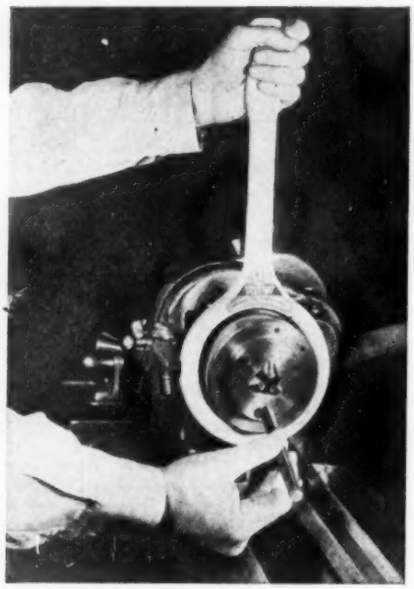


COMPENSATING CHUCK—*Skinner Chuck Co., 344 Church St., New Britain, Conn.* Two-jaw compensating power chuck, Series 23100-A, is designed to drive work on centers where exceptionally heavy cuts are being taken with carbide-tipped tools at high spindle speeds. Compensating action of the jaws is provided by a rocker attached to a plunger.

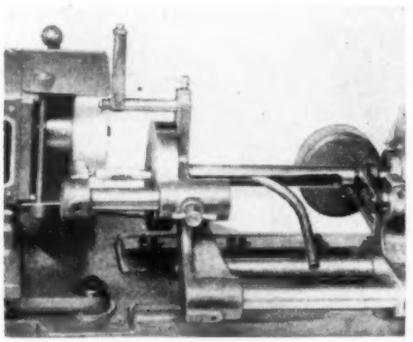


CHUCK—*Modern Collet and Machine Co., 401 Salliotte St., Ecorse, Mich.* Almco Jet-type collet chuck for hand screw machines and engine lathes up to 1-in. capacity is adjustable in 12 steps from 0 to 15,000 lb. gripping pressure. The collet is closed by a spring action and opened by compressed air from 100 psi. line pressure.

LIGHT-DUTY CHUCKS — *Westcott Chuck Co., Oneida, N. Y.* Light-duty chucks are threaded to fit directly on the spindle of lathes having 1½-in., 8-thread spindles without the use of an adapter plate. Style 6900 universal chucks are made in 5- and 6-in. sizes. Style 5900 independent chucks are made in the 6-in. size.

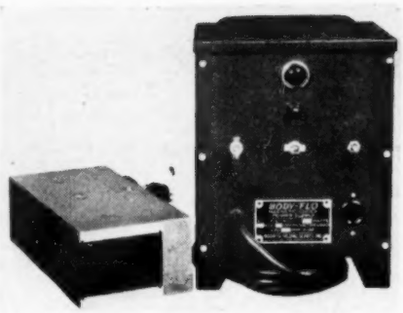


SPEED CHUCK—*Standard Tool and Gage Co., a subsidiary of the Jack & Heintz Precision Industries, Inc., Cleveland 1, Ohio.* The Standard-Hampton Speed Chuck can be opened and closed by a slight movement of the handle without stopping the motor or spindle. If stopping the spindle is desired, the handle can be used as a brake.

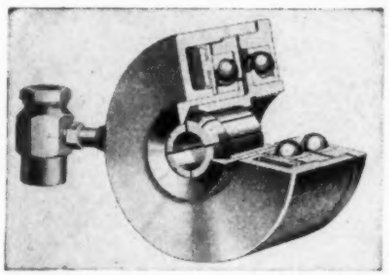


UNIVERSAL CHUCK—*Edward Blake Company, 634 Commonwealth Ave., Newton Centre 59, Mass.* Universal chuck depends on a single pinion-operated, three-lobe cam to actuate the jaws. Turning a pinion by means of an Allen wrench turns a cam which closes the jaws on the work. A spring acts on each jaw to hold it open when the cam is turned in the pressure-relieving direction.

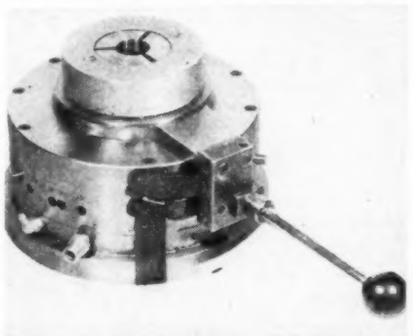
POWER CHUCK WRENCH—*Cushman Chuck Co., Hartford, Conn.* The electric power wrench eliminates the physical labor of manually closing and opening heavy chucks. The motive power is applied through a train of gears and a splined sleeve to a sliding wrench shaft.



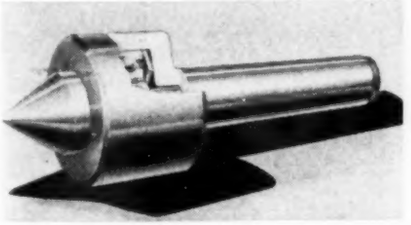
MAGNETIC CHUCK—*Magnetic Holding Devices, Inc., 2034 E. 22nd St., Cleveland 15, Ohio.* An improved power-supply unit for the "Body Flo" magnetic chuck permits application to milling operation. The unit has a power selector to step up the electric current when increased holding power is required.



AIR-OPERATED CHUCK—*Erickson Tool Div., Erickson Steel Co., 2309 Hamilton Ave., Cleveland, Ohio.* Air-operated speed chuck has accurate clamping over the collapsing range of 1/32 in., making it possible for this chuck to take the place of seven standard-size single-purpose collets.

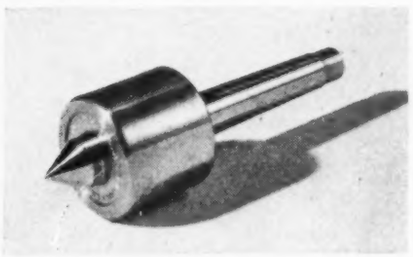


INDEXING CHUCK — *Redmer Air Devices Corp., 601 W. Washington Blvd., Chicago 6, Ill.* Indexing is manual, while the collet is air-operated. Positioning can be changed without removing the fixture from the bed.



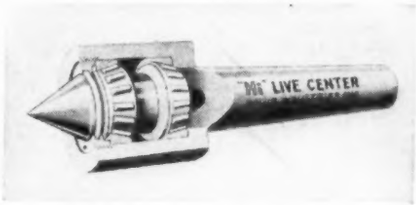
LIVE CENTER—*Raymond Corporation, 412 Republic Building, Cleveland 15, Ohio.* Coles Model 100 live center is said to have unusually high thrust-load capacities. A cupped spring-steel compensator allows the rotating point to move backwards when thrust loads are excessive.

LIVE CENTER—*Samuel S. Gelber Co., 32 S. Jefferson St., Chicago 6, Ill.* A live center, which has the same general dimensions as a standard dead center, has spindle of alloy tool steel, heat-treated to a hardness of 64 Rockwell and precision-ground.



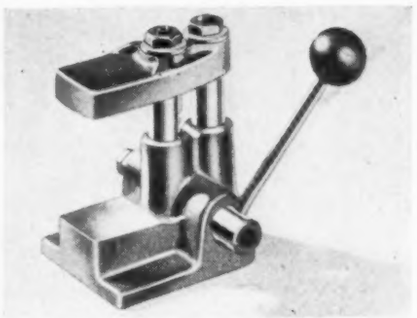
LIVE CENTERS—*Royal Products, 68 Spring St., New York 12, N. Y.* Sizes range from No. 1 to No. 5 Morse Taper in this Regal live center. The hardened and ground points are interchangeable.

CENTER DRIVE—*J. R. Fish Research & Engineering Co., 1341 Main St., Agawam, Mass.* Center drive eliminates the use of grinding dogs and permits grinding both ends of the work, or grinding one or more different diameters, contours, angles and radii in a single plunge operation.



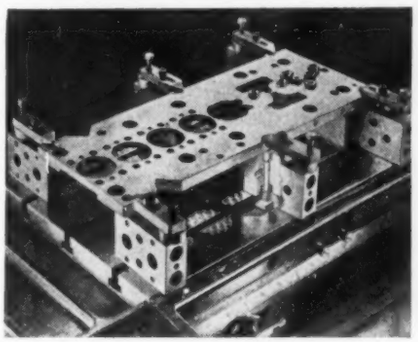
LIVE CENTER—*Holub Industries, Inc., Sycamore, Ill.* "Hi" live centers are equipped with matched and preloaded Timken bearings. Eccentricity or runout of the point is held to 0.0002 in., both free and under load. The centers will carry loads up to 1,000 lb. in the No. 2 and 3 Morse Taper sizes, and up to 2,400 lb. in the No. 4 and No. 5 Morse Taper sizes.

MACHINE CENTERS—*Black Drill Co., Div. of Black Industries, Inc., Cleveland, Ohio.* A line of machine centers of patented design consists of a single shank and an assortment of six noses which thread into the shaft. Once the shank is placed in the spindle it does not have to be removed. Noses can be changed to suit the requirements of the work.

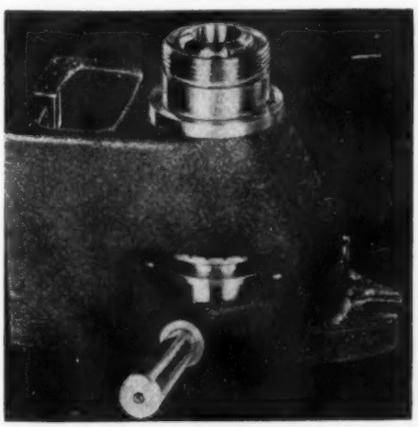


CLAMPING JIGS—*N. A. Woodworth Co., 1300 E. Nine Mile Rd., Detroit 20, Mich.* "Miniature" Cone-Lok jigs have the same operating principle as the larger sizes. They have working spaces are 1x1x1 in. and 1x2x1 in., can be converted from right- to left-hand.

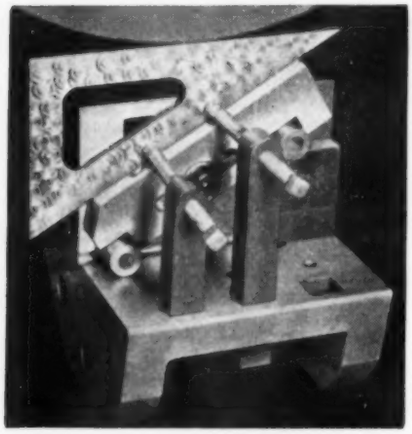
GRIPPING INSERTS—*Kennametal, Inc., Latrobe, Pa.* "Kengrips" are for use as gripping inserts in holding, clamping, and feeding devices. They are made of solid Kennametal with diamond-serrated surfaces. They are available as disks or squares.



PARALLEL SETUP BLOCKS — *Moore Special Tool Co., Inc., Bridgeport, Conn.* Three-way parallel setup blocks which build up to 12 different heights. The set consists of 6 blocks in each of two sizes, 1x2x3 in., and ⅞x1¼x1½ in., packed in a mahogany box. Each block can be used in any of the three dimensions.

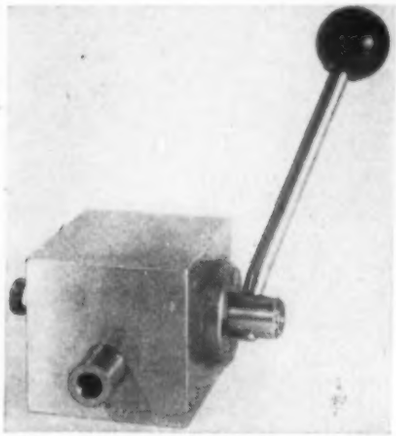


COLLET FIXTURES — *Hardinge Brothers, Inc., Elmira, N. Y.* Two collet-holding fixtures to provide lower-cost fixtures with stationary spindles for production work where indexing is not required have bases machined so they can be used in either the horizontal or vertical position. Both fixtures take standard 5C Hardinge collets. The HV-H fixture and the HV-HN are identical except that the HV-HN has a threaded nose spindle.

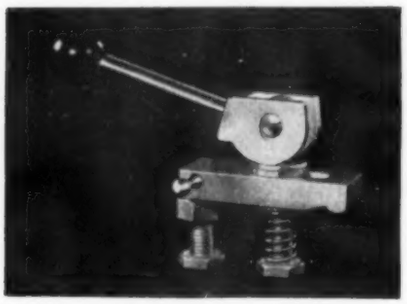


POSITIONING DEVICE — *Hawley Tool and Die Co., 733 W. Lincoln St., Phoenix, Ariz.* Precision holding and positioning device. The Sineversal, consists of a body unit, sine bar, clamp, and screws. Almost any part of any shape within the capacity of the device can be positioned quickly.

SNAP-LOCK JIG—*Hedstrom Industries, Inc., 4856 W. Division St., Chicago 51, Ill.* Unusually light snap-lock jig is made of OH-38 aluminum alloy. Easy shifting to any position is possible.



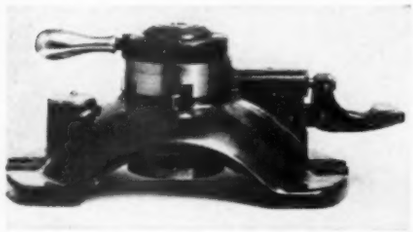
FIXTURE CLAMP—*N. A. Woodworth Co., Ferndale, Mich.* Cone-Lok fixture clamp is a self-contained clamp applicable to the majority of clamping operations. Manufactured in three sizes, it employs a mechanism which consists of male cones formed on the pinion shaft and which fit closely with female cones integral with housing.



FIXTURE CLAMPS—*West Point Mfg. Co., Farmington, Mich.* Five Wespo fixture clamps for holding work have ground stud washers with ground spherical radii, allowing the clamps to float and compensate for irregularities in the work.

JIG AND FIXTURE PARTS—*Jergens Tool Specialty Co., 712 E. 163rd St., Cleveland 10, Ohio.* A complete line of jig and fixture accessory parts. One feature of the line is the soft jaw blanks for key-type scroll and air chucks. All items in the line are hardened and black penetrated to prevent rusting while in stock. Threads are protected with "Seal Peel."

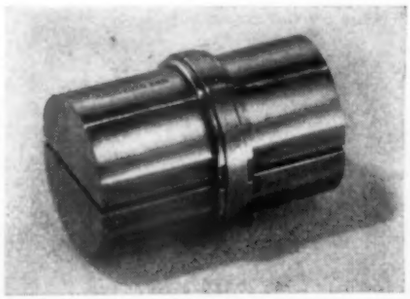
JIG AND FIXTURE PARTS—*Morton Machine Works, 2422 Wolcott St., Ferndale 20, Mich.* Jig and fixture components, each available in a range of sizes are made of heat-treated alloy steel.



COLLET INDEXING FIXTURE—*G & H Mfg. Co., 327 Elm St., Fitchburg, Mass.* Stock does not change position during collet closing action in this fixture. For milling, grinding, drilling and shaper operations the fixture can be positioned horizontally or vertically.

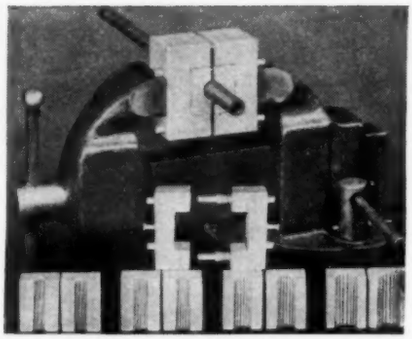
WORK-REST BLADES—*Scully-Jones & Co., 1901 S. Rockwell St., Chicago, Ill.* Carbide-tipped, work-rest blade has segmented design. Damage to one or more of the segments does not require scrapping of the blade, since it can be returned to the factory and the damaged segments replaced at low cost.

EXPANDING MANDREL—*Erickson Tool Div., Erickson Steel Co., 2309 Hamilton Ave., Cleveland, Ohio.* A precision expanding mandrel with an eccentric sleeve holds eccentric parts for grinding or machining within a tolerance of 0.0005 in. Eccentric parts can be turned or finished with the same tools and equipment used for concentric parts.

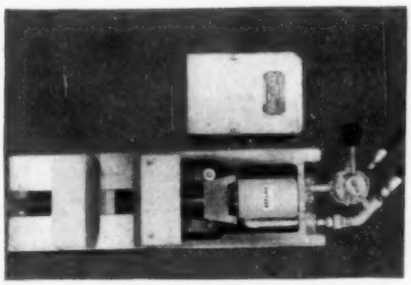


EXPANDING ARBOR — *Asco Corp., 874 East 140th St., Cleveland, Ohio.* An expanding arbor, the "Auto-Arb," for use on secondary operations where the workpiece is held by the inside diameter. The arbor permits chucking and unchucking without stopping the spindle when used on a screw machine or lathe with standard collet. It is made in sizes from ⅜ to 1 in. with intervals of 1/64 in.

MANDREL—*Young Arbor Co., Dept. L, 3257 Bradford Rd., Cleveland Heights 18, Ohio.* Work placed on the mandrel is locked in place automatically, ready for machining. When extreme cutting pressure is encountered, the work is held tighter.



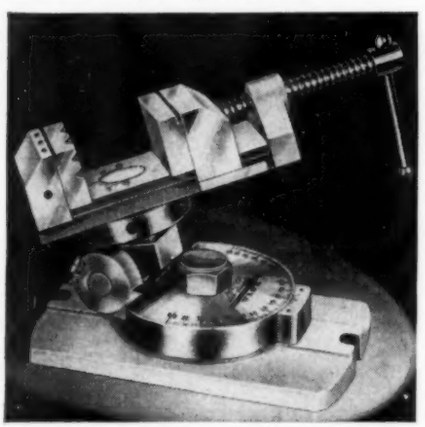
VISE BLOCKS—*J. A. Campbell Co., 645 E. Wardlow Rd., Long Beach 7, Calif.* Holds small pipe in any vise without crushing or marring surface or threads. Known as Nip-Grip, it consists of two light-alloy retainer blocks in which hardened-steel inserts are slipped to hold pipe of different sizes.



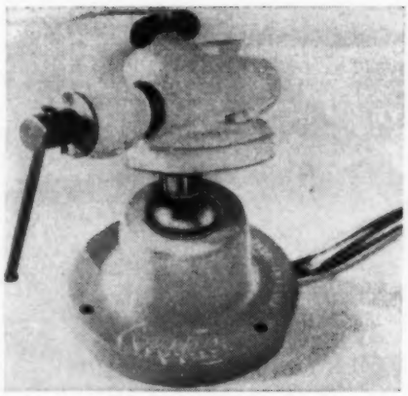
VISE — *Production Devices, Inc., Whitehall, N. Y.* The three large sizes of Airlox Senior vises are now produced in a hydraulic adaptation. When mounted on a machine tool, hydraulic line pressure is taken from the hydraulic pump of the machine.

COMBINATION VISE—*Downing Engineering Co., 807 S. Main St., Dayton 2, Ohio.* The vise jaw that locates the part for milling is attached to the stationary part of the vise. The draw bars are adjusted to suit the part so that it is locked by cam action.

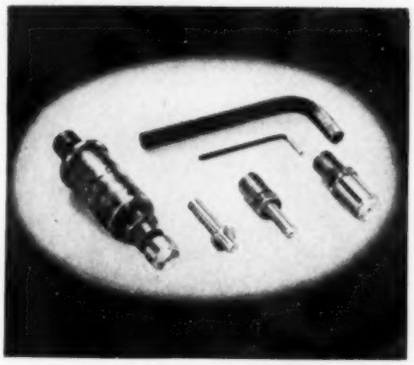
BENCH VISE—*Grand Specialties Co., Grand Ave. at Troy St., Chicago 22, Ill.* Heavy-duty bench vise, the "Vise Master" can be closed by a push on the free jaw and opened by trigger release. It will revolve 360° on its base. The vise weighs 23¾ lb. and has a maximum opening of 4⅜ in.



VISE—*Machinists Tool Co., 2834 West Lake St., Chicago 12, Ill.* Vise swivels 360° on its face, and has 90° vertical adjustment. Matco All-Angle is suitable for use on grinders, drill presses, and other machine tools or for bench use.

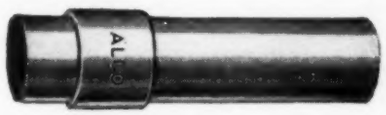


VISE—*Reypo Corporation, 9900 Lincoln Blvd., Los Angeles 45, Calif.* Universal ball vise holds work at any desired angle without dead motion. Body of the vise is inclosed to exclude dust and chips. Jaws are interchangeable, reversible and hardened to Rockwell C 55-58.

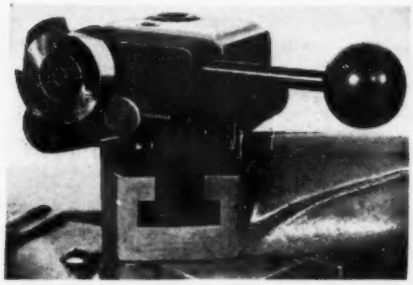


LATHE COLLET STOP—*Hardinge Brothers, Inc., Elmira, N. Y.* The universal stop, when applied to any standard 1-in. capacity lathe collet, will convert that collet into a solid stop or spring ejector stop collet without alteration to the standard collet.

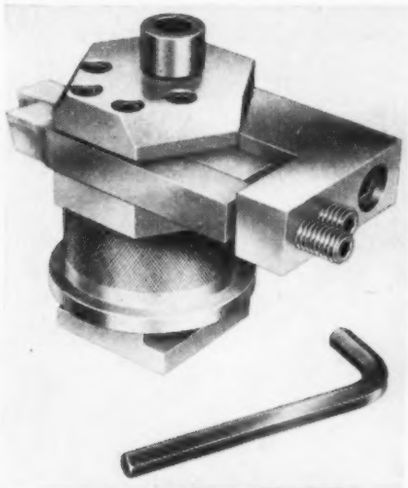
UNIVERSAL STOP—*Hardinge Bros., Inc., Elmira, N. Y.* Universal lathe collet stop for second-operation work will convert any standard 1-in. capacity lathe collet into a solid stop or spring-ejector stop collet.



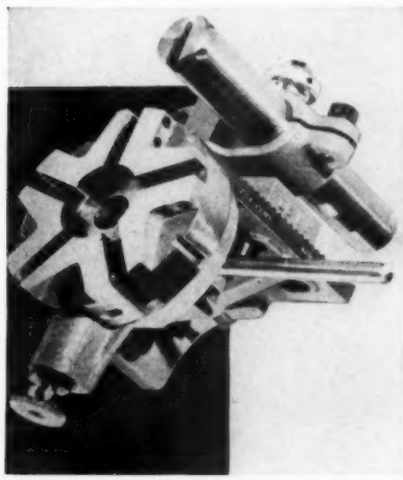
REVOLVING STOP—*Alco Tool Co., Birdseye St., Bridgeport 4, Conn.* A revolving stop for automatic screw machines has dual bearings completely enclosed to exclude chips or dust. It is made in sizes from 3 to 6 in. over-all length, ⅝ to 1½ in. shank diameter, and 3/9 to 1½ in. contact diameter of head.



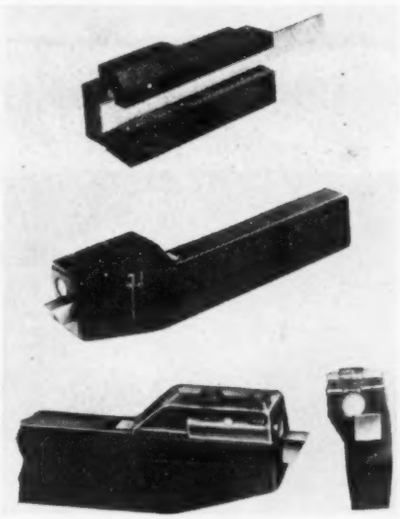
TOOL HOLDER—*Foulk Engineering Co., 4208 Airport Road, Cincinnati 26, Ohio.* A formed threading tool arrangement for chasing external threads has been added to the standard tool holders available for the Retract-A-Tool. The Retract-A-Tool automatically snaps the tool away from the work at the end of each threading cut at precisely the same point.



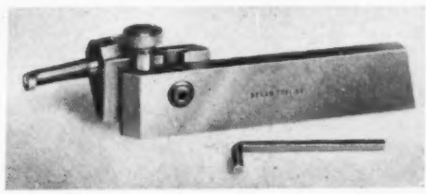
TOOL ADJUSTMENT BLOCK—*Howard Dearborn, Inc., 3370 W. 140th St., Cleveland, Ohio.* Tool adjustment block for use with Howard Tool Holders can be mounted on either side of the holder. The design facilitates changing tools or the angle of tool setting without changing the position of the toolholder.



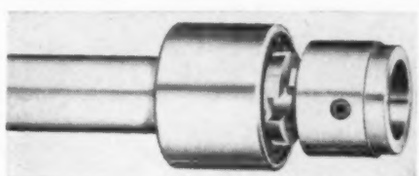
LATHE TOOLHOLDER—*True-Line, Inc., Milwaukee, Wis.* The turret head holds five tools and, in addition, the holder is equipped with an outboard type of boring bar which permits simultaneous inside and outside machining. The center of the turret is a No. 3 Morse taper.



TOOL HOLDERS—*The Cooper-Bessemer Corp., Industrial Tool Division, Mt. Vernon, Ohio.* A new line of drop-forged lathe turning and cutoff tool holders with a clamping pin which engages the bit through nearly its entire length. Two flush-type setscrews lock the bit into position.



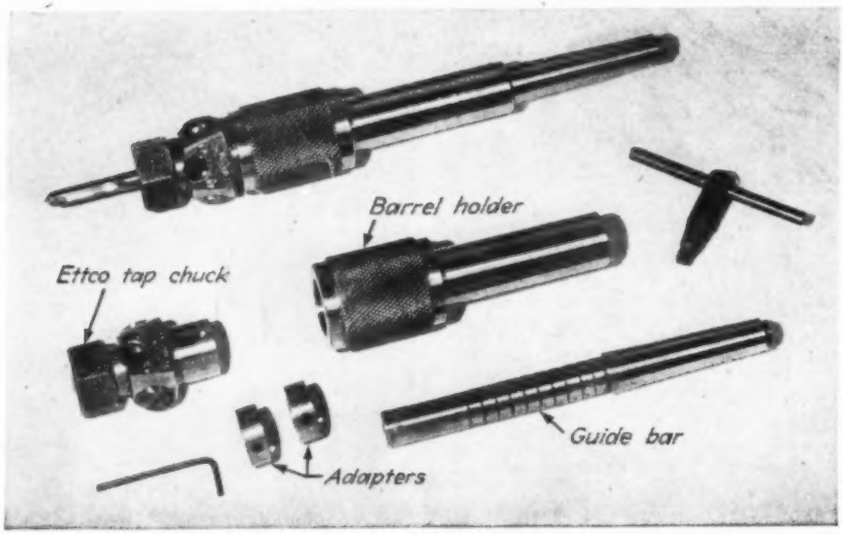
BORING TOOLHOLDER — *Bokum Tool Co., Detroit, Mich.* Vertical adjustment of boring tools is provided in lathe toolholder. Turning the knurled screw moves the tool in a vertical parallel plane to bring it to any precision setting. The holder is available with ½- x 1½-in. shank and ⅜- x 1-in. shank.



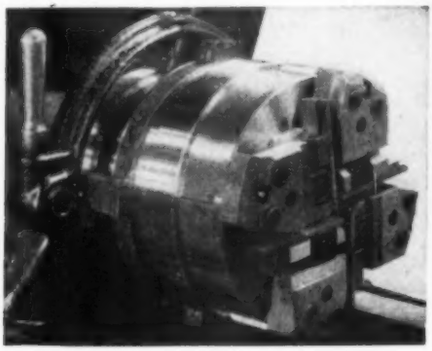
TAP HOLDER—*Burg Tool Mfg. Co., Dept. C4, 6709 South San Pedro St., Los Angeles 3, Calif.* "Tool-Flex" releasing tap holder includes self-centering and full-floating resulting from its oil-resistant Neoprene insert. The flexibility is said to compensate for parallel and angular misalignment, eliminate binding which causes tap breakage, and assure accurate tapping.

HOLDER—*Peerless Tool & Engineering Co., 1121 N. Kilbourn Ave., Chicago 51, Ill.* The "Lawrenz Thread Faster" retracts the toolbit from the work at precisely the same point each time a thread is cut. When threads must run up to a shoulder, the automatic retraction permits the lathe to be run at top speed without danger of overrunning. The unit is adaptable to any bench lathe up to a 12-in. swing.

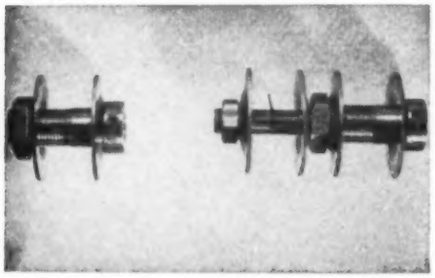
TAP HOLDER—*Barnaby Manufacturing and Tool Co., 70 Knowlton St., Bridgeport, Conn.* The Jam-Proof nonreleasing tap holder is said to monitor severe tapping operations without sticking.



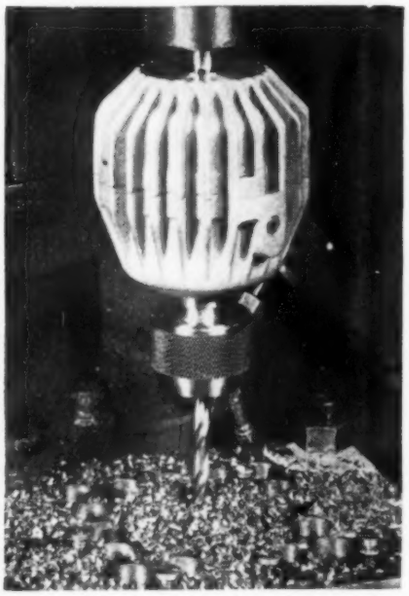
DIE AND TAP HOLDER — *The Thread Miller Corp., 17 E. 42nd St., New York 17, N. Y.* Grip Slide makes it unnecessary for the operator to shift the tailstock or the tailstock spindle in order to advance the die-head or tap chuck to the work. He merely slides the die-holder back and forth on a guide bar, which is held in the tailstock. The barrel-type die-holder is large enough so that the operator need use only a light grip to prevent rotation with the work.



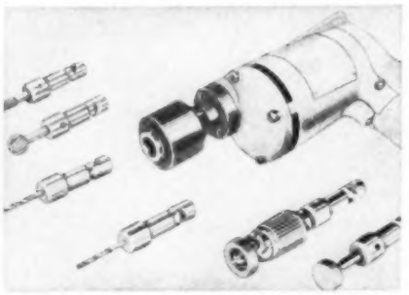
CHASER HOLDERS—*The Landis Machine Co., Waynesboro, Pa.* Lanco VV hardened and ground dieheads in 1, 1½, 2 and 2½ in. sizes for use on hand-operated threading machines. The manner in which the chaser holders are clamped permits removal of the holders from the face of the head without disassembling.



ARBORS—*A. D. McBurney, 939 W. 6 St., Los Angeles 14, Calif.* The No. 150 Super Arbor is a combination attachment arbor for ½-in. electric motor shafts designed to take grinding wheels with ⅝-in. holes on main shaft, or ½-in. holes on the small ends.



CHIP BREAKER—*Continental Tool Works, Div. of Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich.* Drill chip breaker breaks the chip at each revolution of the drill, into uniform small pieces that are easily carried up the flutes of the drill. It imparts a reciprocating action to the drill which breaks the chips.



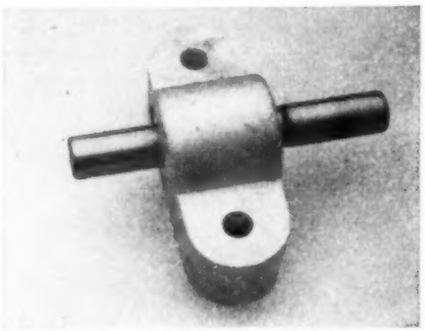
HIGH-SPEED CHUCK—*Rayco Mfg. Co., 3911 S. Prairie St., Chicago 15, Ill.* High-speed production chuck for drill-press and hand power tools permits quick tool changes without shutting off the power. Centrifugal force is used to move a ground and hardened driver into the adapter slot.

AUTOMATIC DRILL CHUCKS—*The Wahlstrom Tool Div. of the American Machine & Foundry Co., 5502 Second Ave., Brooklyn 20, N. Y.* Automatic tapper is designed for sensitive operation. Power increases in proportion to the pressure exerted on the handle and the slightest upward movement of the drillpress handle instantly reverses the direction of rotation. Automatic drill chucks are so designed that it is not necessary to stop the drillpress when changing tools. A slight grip on the knurled sleeve serves to open the jaws and release the tool.

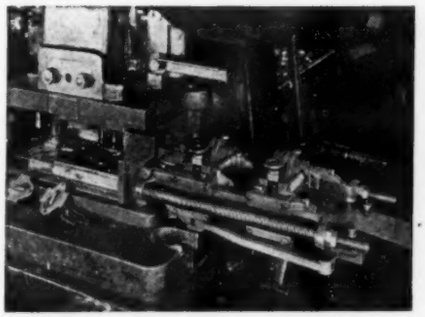
DRILL STAND AND SCRIBER — *Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.* Drill stand holds 32 drills from 1/16 to ½ in. in multiples of 1/64 in. Toolmaker's scribers use conventional phonograph needles for points.

DRILL HOLDER—*Boyar-Schultz Corporation, 2110 Walnut St., Chicago 12, Ill.* An adjustable drill and reamer holder made from drop-forged alloy steel is designed to withstand impact and strain. The holder is available in three sizes: 00, 0, and 2. Either long or short shank is available in 00 and 2 sizes.

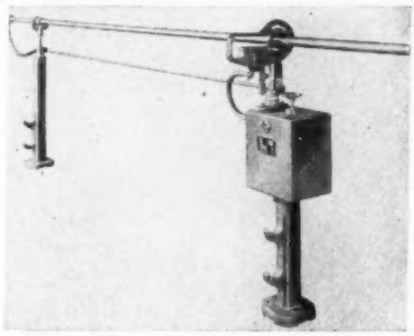
INDEXING HEAD — *Grinders and Fixtures, Inc., 1255 W. Fourth St., Cleveland 13, Ohio.* Indexing head designed to hold straight or taper-shank tools from 1/16-in. to 1½-in. dia. for regrinding on a surface grinder can be set up on any standard grinding or milling machine. The head rotates 360° in each of the three planes. Positive locking devices hold the tool at any desired angle in relation to the grinding surface.



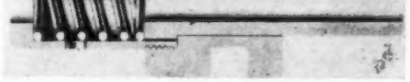
ARBOR—*Poly Products, 406 S. Chester Ave., Pasadena 5, Calif.* A plain Spindle arbor, Model B15-O has permanently lubricated and sealed ball bearings mounted in a cast aluminum housing. The spindle is ⅝ in. in diameter and has working ends of 1¼ and 1½ in.



PUNCH PRESS FEEDS—*H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass.* Two punch press feeds have a feed length of 6 in. on presses with a stroke of 3 in. or more. One size feeds coiled strips in thicknesses up to 3/16 in. and widths up to 4 in. The other feeds coiled strips in thicknesses up to 3/16 in., widths to 6 in.



PNEUMATIC BAR FEED—*Lipe-Rollway Corporation, Syracuse, N. Y.* New pedestals with smaller floor space are used on several models, and the control cabinet has been moved to the forward end of the feed cylinder. Two sizes for small hand screw machines have been added: Model 68, ½-in. dia. x 12-ft. length, and Model 100, ¾-in. dia. x 12-ft. length.



FEED TUBES—*Modern Collet and Machine Co., 401 Salliotte St., Ecorse 18, Mich.* A complete line of shock-absorbing feed tubes for all sizes and models of Brown & Sharpe automatics which do not have a spring safety device incorporated in the feeding mechanism of the machine.

CONVEYOR FEED—*Peerless Machine Co., Racine, Wis.* Automatic pull-up and gaging in lengths from ⅛ to 48 in. are possible with a conveyor developed for mechanically controlled power saw. In case of accident or blade breakage, the machine is automatically stopped. When the last stub of metal on the conveyor contacts the limit switch, the cycle stops.

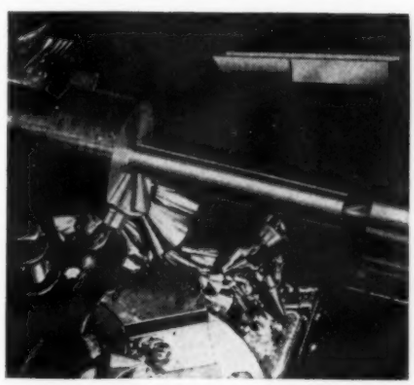
HEAVY-DUTY DRILLS—*Chicago-Latrobe Twist Drill Works, 411 W. Ontario St., Chicago 10, Ill.* Heavy-duty drills designed to give top performance on drilling operations in tough and hard materials can be used on heat-treated steels up to 375 Brinell hardness. Sizes range from ½ to 1½ in. dia. in regular taper shank series.

TOOLS — *Kennametal, Inc., Latrobe, Pa.* Two tools with clamped-on tips for lighter machining jobs, styles ICL and 2CL, have offset shanks. Styles 11CL and 12CL have straight shanks. Tips can be supplied with permanent, molded-in chip breaker of constant depth, adjustable in width. The new tools are available in three sizes: 1x1x7 in., 1x1¼x9 in., and 1x1½x10 in.

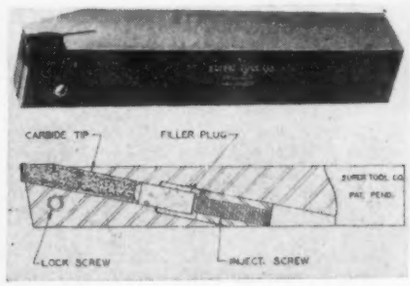
TOOLBIT—*Kennametal Inc., Latrobe, Pa.* Carbide-tipped toolbits for knee attachments of turret lathes are available in a range of Kennametal compositions for machining steel, cast iron, and non-ferrous metals.

GROOVING TOOLS — *Kennametal, Inc., Latrobe, Pa.* Line of solid Kennametal grooving-tool blades permits more regrinds than with tools having brazed-on tips. Rigidity of the blade is said to minimize weaving and give longer service between grinds on grooving jobs. Standard sizes are ½ in. high and 2½ in. long, and ¾ in. high and 4 in. long.

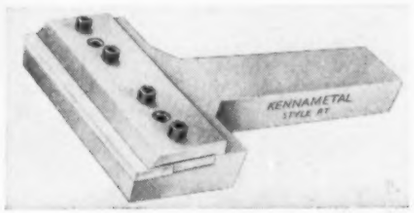
CUTOFF CUTTERS—*The Keene Valley Engineering Co., Keene Valley, N. Y.* Straight-shank cutoff and form cutters and adapter which permits these tools to be used in place of circular form tools for short runs.



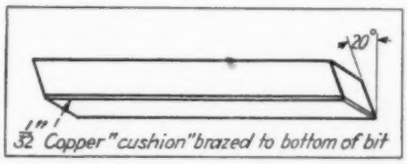
TOOLBIT—*Fearless Tool Co., 1234 S. Gramercy Place, Los Angeles 6, Calif.* The Shearcutter is said to cut metal with a knife-like action instead of chiseling it off. The illustration shows a ⅜-in. Shearcutter bit taking a 1⅛ in. cut under power feed in cold-rolled steel. Faster cutting speeds are possible with lack of heat.



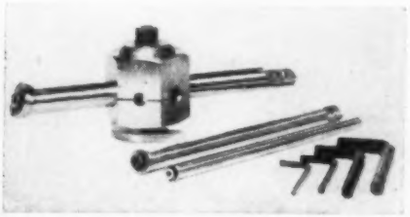
TOOLBIT — *Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* A toolbit which holds the carbide tip mechanically, is supplied in a variety of standard sizes and contains an insert bit of solid carbide. The inserts are large, providing a heavy cross-section to take deep cuts and heavy feeds.



BROAD-NOSE TOOLS — *Kennametal Inc., Latrobe, Pa.* Line of broad-nose tools is for turning cast-iron rolls up to 90 Sclerascope. In tests of the tools, a roll that required 25 hr. for rough grinding was turned with two 8 in. tools in 8½ hours.

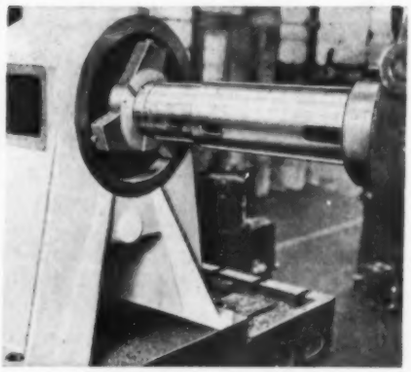


COPPER-CUSHIONED TOOLBITS—*General Tool & Die Co., 555 Prospect St., East Orange, N. J.* Made from high-speed steels with a copper cushion 1/32 to 1/16 in. thick brazed to the bottom of the toolbit to absorb shock.

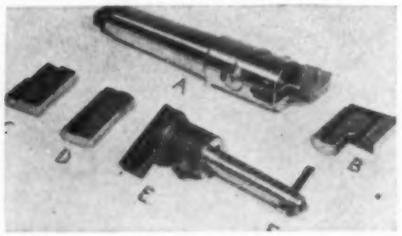


TURNING TOOLS—*Fearless Tool Co., 1234 S. Gramercy Place, Los Angeles 6, Calif.* Shearcutter boring, turning, and facing tool has a circular cutter bit. New cutting edges may be presented to the work by rotating the bit. Penetration angle of the tool is said to be such that a shearing action is attained.

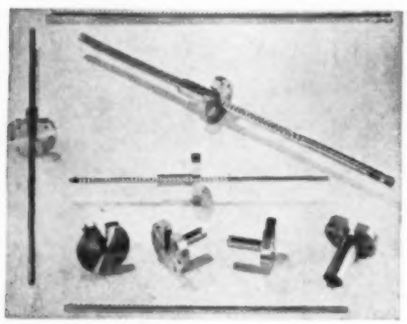
SMALL TOOLS—*Kennametal, Inc., Latrobe, Pa.* A very hard Kennametal Composition, Grade K5H, for small tools used in precision boring, has a Rockwell A hardness of 93.2, great resistance to cratering, and is said to be unusually strong for such a hard material.



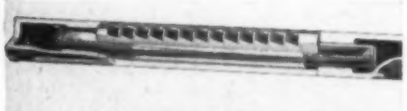
BORING HEAD—*Kaukauna Machine Corp., Kaukauna, Wis.* Three separate cuts can be made without replacing the boring head with the Kwik-Size boring tools. Each head carries three single-point boring tools and is eccentric with the tapered arbor, so that only one tool cuts at a time. The head can be set up with a roughing tool, a semi-finishing tool, and a finishing tool. Heads are made in various sizes, each adjustable within a range of ⅜ in.



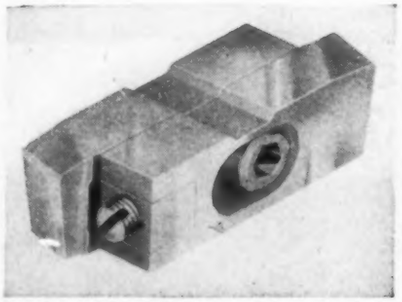
BORING BARS—*Behr-Products Co., Dept. 3, 1373 Woodward Ave., Detroit 3, Mich.* Taper-shank boring bar *A*, is said to take cuts up to ¾-in. on a side without chatter. Standard facing cutter *B*, back-facing blade *C*, and end-cutting fly tool blade *D* are used with the bar.



KEYWAY BROACHES—*Zagar Tool, Inc., 23880 Lakewood Blvd., Cleveland 17, Ohio.* These standard keyway broaches are made in sizes from ⅛- to ½-in. keyways. The adaptors to fit them are for broaching holes from ½- to 1¼-in. diameter.



KEYWAY BROACHES—*East Shore Machine Products Co., East 140th St. and Aspinwall Ave., Cleveland, Ohio.* American Standard Keyway sizes have been included in the Glenny adjustable-expansion keyway push broach line. Broaches in steps of 1/16 in. dia. have been made available.

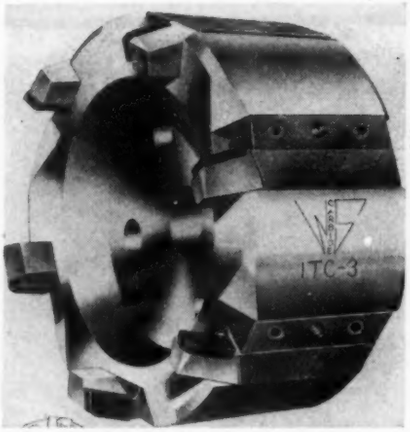


ROUGH BORING TOOL—*Madison Mfg. Co., Spring and Bauer Sts., Muskegon, Mich.* A rough boring tool in which the cutter blades themselves form the cutting block. A single micrometer-thread screw expands both blades equally from the centering slot.

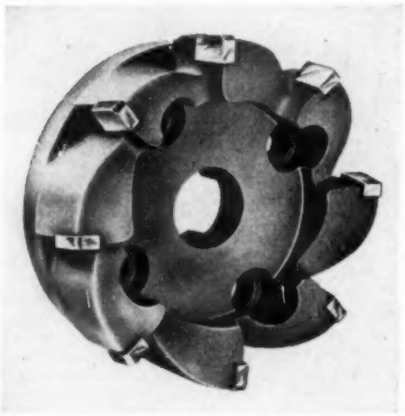
BORING BITS—*Samuel S. Gelber Co., Dept. H, 542 West Washington Blvd., Chicago 6, Ill.* Carbide-tipped boring bits with round and square shanks are made in two grades, one for cutting steel and one for general-purpose work, with alloy-steel shanks.

BROACH—*Fearless Tool Co., 1234 S. Gramercy Place, Los Angeles 6, Calif.* The Shearcutter "Rotary Broach" has a high spiral or helical cutting edge which removes the metal in a shearing manner. The broaches are made with straight shanks in sizes from ½- to 1-in. by sixteenths, and from 1⅛- to 1½-in. by eighths.

FLY CUTTER—*Wendt-Sonis Co., Hannibal, Mo.* Universal fly cutter does all types of ordinary and step milling. Only one cutter body is needed to handle about 75% of the milling jobs, since the inserted teeth are interchangeable.

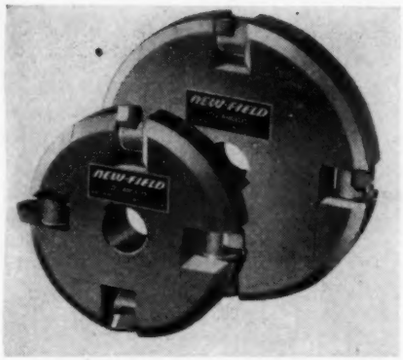


MILLING CUTTER—*Wendt-Sonis Co., Hannibal, Mo.* An inserted-tooth carbide cutter, with blades interchangeable for any type of milling job, is said to require less power than ordinary cutters.

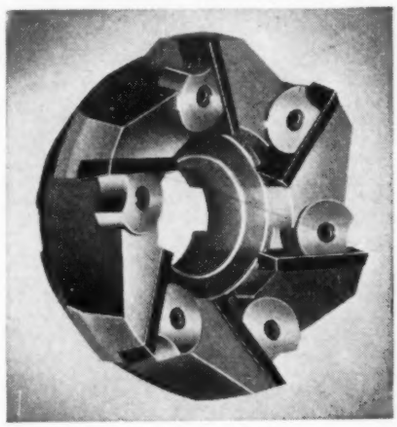


CARBIDE-TIPPED MILLS — *Nelco Tool Co., Inc., 370 Hamilton Ave., Brooklyn, 31, N. Y.* The line includes two- and four-flute carbide end mills from ¼ in. to 2 in. in dia., large end mills up to 5-in. dia. with No. 50 NMTB shanks, shell end mills, face mills, slotting cutters and half side mills up to 8 in. dia.

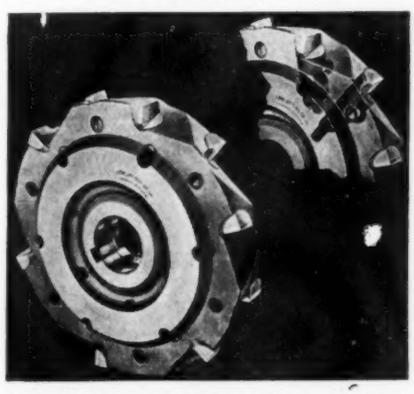
CUTTER BLADE LOCK—*McCrosky Tool Corp., Meadville, Pa.* Jack-Lock assembly consists of a semi-circular wedge fitted with a fine pitch screw in a recess adjacent to the blade. When tightened, the screw bears against the bottom of the recess, raising the wedge against the blade with a compound wedging action.



FLY CUTTERS—*New-Field Machined Parts Co., 549 W. Randolph St., Chicago 6, Ill.* Two extra heavy models of the universal fly cutter are designed especially for application on shell and mill arbors, they are 1⅜ in. thick and 6 and 8 in. in diameter.



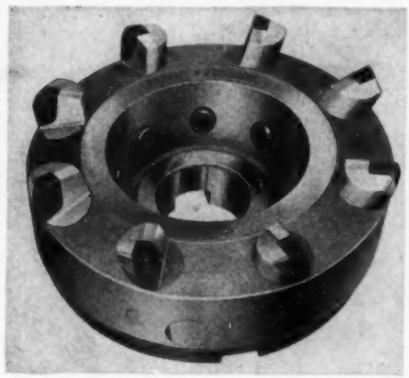
FACE MILL—*Beaver Tool & Engineering Corp., 2850 Rochester Rd., R. 1, Royal Oak, Mich.* Solid carbide-blade face mill incorporates blades that can be changed by releasing the locking wedges. They can be reset by use of a dial indicator.



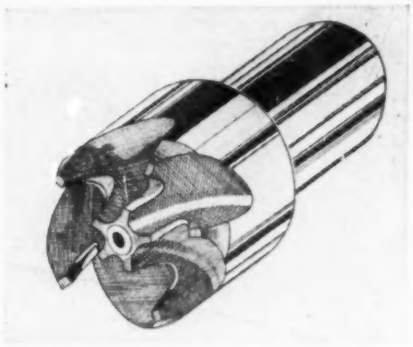
SLOTTING CUTTER—*Lovejoy Tool Co., Inc., Springfield, Vt.* Sensitive control of blade settings is obtained by the addition of a screw adjustment in the Type F slotting cutter. Each blade is set at a slight angle to the cutter body. Cutters are made as standard items in face widths from 7/16 to 1½ in., with diameters 5 to 18 in.

MILLING CUTTER — *Kennametal Inc., Latrobe, Pa.* Universal-Face Kennamill consists of a heat-treated steel body with a set of detachable solid Kennametal blades. Five standard sizes, 4, 6, 8, 10, and 12 in. in dia. have blades of the same cross-section.

MILLING CUTTERS—*Super Tool Co., Detroit, Mich.* Standard carbide-tipped cutters for milling cast iron are made in plain, side, half side, shell and face mill forms. High production rate and excellent finish are claimed.



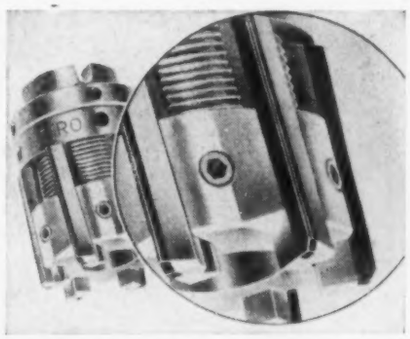
CUTTERS—*Tungsten Carbide Tool Co., 2661 Joy Rd., Detroit 6, Mich.* Vibra-Cushioned cutters have thick carbide tips on a round steel blade which is wedge-locked into the cutter body. Produced for National Standard Drive, with 6-, 8-, 10-, and 12-in. OD.



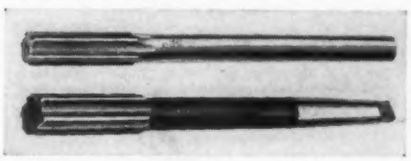
DEBURRING CUTTERS—*Severance Tool Industries Inc., Saginaw, Mich.* Solid tube deburring cutters are said to remove stock so cleanly and smoothly that holding work in vises or other fixtures is seldom necessary. The cutter is made in more than 100 different sizes for tubes of various wall thicknesses and diameters up to 2¼ in.

FACE MILL — *Lovejoy Tool Co., Springfield, Vt.* A face mill which will take either left- or right-hand blades, the "Cutsall," holds the blade face slightly back of center so that positive and negative radial rake can be obtained from the same blades.

END MILL—*Nelco Tool Co., Inc., 370 Hamilton Ave., Brooklyn 31, N. Y.* A Carboloy-tipped three-flute end mill said to be capable of plunging into solid metal. The design provides increased chip room and is said to result in cooler and freer milling. Sizes range from ⅜- to 2-in. dia.



EXPANDING REAMERS — *Metro Tool and Gage Co., 4240 W. Peterson Ave, Chicago, Ill.* 1- to 6-in. heavy-duty solid shank and shell-type expanding reamers with H.S.S. or carbide cutting edges, are designed with a low expansion angle to lessen the O.D. grinding when resharpening.

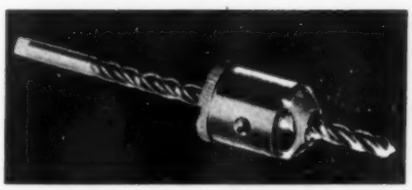


CARBIDE-TIPPED REAMER — *Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* A carbide-tipped solid reamer with the tips extending the full length of the fluted section of the tool. Scoring or galling is said to be reduced to the minimum.

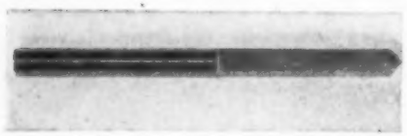
ADJUSTABLE REAMERS—*Lempco Products, Inc., Dunham Rd., Bedford, Ohio.* Adjustable helical reamer with opposing helixes at the cutting edge provides a two-way cutting action which produces mirror-like finishes in holes.

REAMERS—*N. J. Daniels Tool Co., Inc., Haverhill, Mass.* Hand and chucking reamers are available straight- and spiral-fluted, carbon and high-speed steel, with accuracy to 0.0002 in. They are available in sets of various sizes ranging from ¼ to ½ in. by 16ths, to ¼ to 2 in. by 16ths.

CENTER DRILL—*Reltool Corp., Box AM-6, Milwaukee, Wis.* The "Shockless" combination center drill includes a fillet at the point where the 60° countersink angle meets the tip. Transition from the straight flute of the tip to the angle of the countersink is smoothed out and shock to the tool is avoided.



JET DRILL—*Republic Drill and Tool Co., 322 So. Green St., Chicago, Ill.* Jet drills achieve fast drilling rates with coolant, delivered to the cutting lips at high velocity and pressure.



DRILL—*Enesay Tool Co., 2240 Sepulveda Blvd., Los Angeles 25, Calif.* Steel hardened to 68 Rockwell C can be drilled. Tensile strength of the drill, available in standard sizes, is more than 45,000 psi.

TAPERED CUTTING TOOL—*Conical Tool Co., 423 Division, South, Grand Rapids 3, Mich.* A tapered cutting tool or end mill intended for use in making die-casting dies, is made with a constant spiral, with a uniform angle for the entire length of the flute.

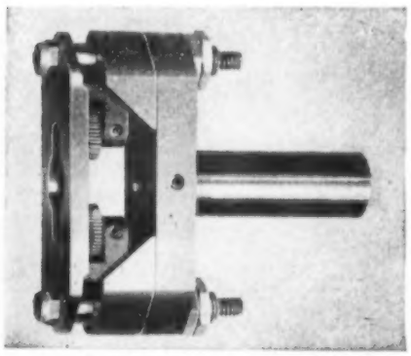
TWIST DRILLS—*Threadwell Tap & Die Co., Greenfield, Mass.* Complete line of high-speed twist drills include high-speed taper-shank drills in all standard sizes up to 1½ in. dia., and high-speed straight-shank drills in taper lengths, wire gage sizes and jobbers lengths.

MASONRY DRILLS—*Chicago-Latrobe Twist Drill Works, 411 W. Ontario St., Chicago 10, Ill.* Carbide-tipped masonry drills are available in a range of sizes from 3/16 to 1½ in. in diameter. They are furnished oversize.

MASONRY DRILL—*New England Carbide Tool Co., 60 Brookline St., Cambridge, Mass.* A carbide-tipped drillbit to drill holes in masonry is said to drill holes 50% faster and to last 50 to 75% longer than high-speed drills. The drills are made in stock sizes starting at 3/16 in. and going up by sixteenths to 1½ in.

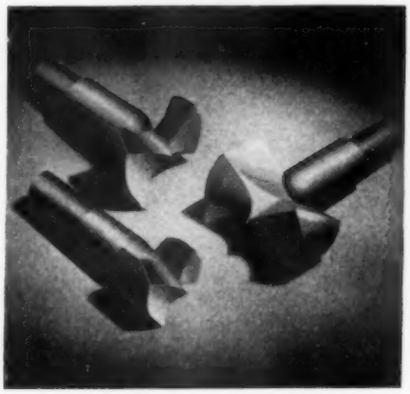
MASONRY DRILL—*Willey's Carbide Tool Co., 1340 W. Vernor Highway, Detroit 1, Mich.* Masonry drills with carbide tips range from 3/16- to 1½-in. dia. Used for non-metallic materials, they are said to give 75% faster drilling speeds without chipping.

SHORT DRILLS—*Whitman & Barnes, Div. of United Drill and Tool Corporation, Detroit 16, Mich.* Short-length drills for use in screw machines are properly proportioned as to length, web thickness, and flute contour.



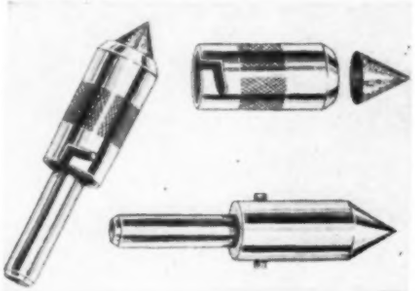
KNURLING TOOL—*Barnaby Mfg. & Tool Co., 70 Knowlton St., Bridgeport 8, Conn.* A knurling tool for automatic hand screw machines permits knurling behind shoulders or any distance from the end of the work without using backrests.

SHORT DRILLS — *Chicago-Latrobe Twist Drill Works, 411 W. Ontario St., Chicago 10, Ill.* For use in screw machines where operating conditions require short, sturdy drills, a line of stub screw-machine drills is made, in wire gage from No. 1 to No. 60, letter sizes A to ZZ, and fractional sizes from 1/16 to 2 in.

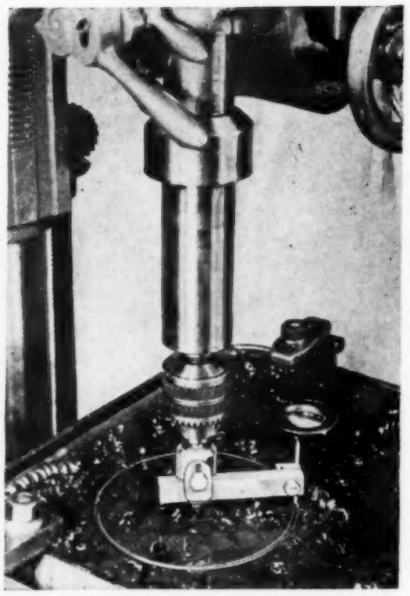


MILL DRILL—*Barco Machine Products Co., 1975 E. 65th St., Cleveland 3, Ohio.* A mill drill, the Micro-King, for sheet metal and plastics, is made of tool steel. The drills are self-centering, require no lead holes.

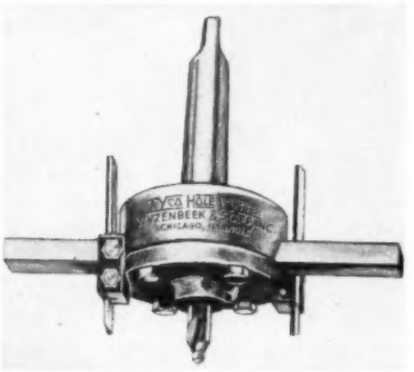
HIGH-SPEED DRILL—*New Britain Machine Co., New Britain, Conn.* Alloy steel twist drills, for hard or soft steels are packed in the Huot container. The drills fit indexed slots in hinged panels which stand up when the box is open, and lie flat when it is closed.



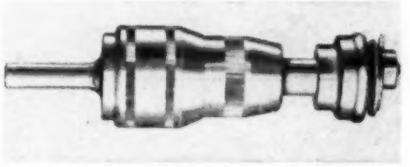
CENTER-LAP TOOL—*J. R. Reich Mfg. Co., 45 E. Stroop Rd., Dayton, Ohio.* Center-lap tool has replaceable emery-cloth cones fitting over machined and ground 60° mandrel. The cones are formed with a curved seam which is said to assure accurate lapping without chatter. They are available in 100, 120, and 150 grit. A sleeve holds the cone in place and is fastened with a quick-acting bayonet lock, permitting rapid change of cones. The tool has a 5/16-in. shank.



CIRCLE-CUTTING TOOLS — *Bruno Tools, Beverly Hills, Calif.* Adjustable hole-cutting tool cuts smooth large-size holes in wood, steel, brass, hard rubber, aluminum, plastics and other materials. Diameters can be varied from 1⅞ to 8 in. through ¼ in. thickness in steel and 1½ in. in plastics.



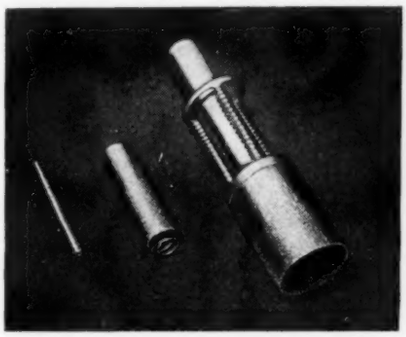
HOLE CUTTER—*Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill.* Heavy-duty hole and washer cutter cuts through material up to ½-in. thick. The unit fits a 1-in. drill chuck, or can be furnished with Morse taper shank.



INTERNAL GROOVING TOOL — *Lyon Machine Co., Worcester, Mass.* The tool is operated on a cam principle. Depth of cut is regulated by an adjusting screw. Model A is for bore dia. from ⅛ to 1⅜ in., with a maximum depth of groove of 0.273 in., model B for dia. 1 7/16 to 2⅜ in., with maximum depth of 0.247 in., model C for dia. 2 7/16 to 4 in., with maximum depth of 0.325 in.

TRANSPARENT COATING—*Barber-Colman Co., Rockford, Ill.* A transparent, amber-colored cellulose compound, "Protecto-Coat," is being used to protect cutting tools. Protection for the cutting edges as well as safer handling is obtained.

RAISED-HUB DISKS—*Bay State Abrasive Products Co., Westboro, Mass.* Bayflex raised-hub disk wheels are said to outwear abrasive-coated disks and to be applicable for grinding and cutting off. The disks are applicable for work on welded or brazed metals and grinding aluminum castings.



DIAMOND TUBES—*Wickman Corp., 15533 Woodrow Wilson Ave., Detroit 3, Mich.* Habib tube-type diamond drills are designed for drilling or trepanning abrasive or brittle materials. The diamond particles are evenly distributed throughout the wall section rather than being on the outer surface alone. Wall thickness of the drills is less than 0.024 in. They are available in standard sizes from 3/32- to 3-in. dia.

GRINDING WHEEL—*The DoAll Co., 1301 Washington Ave., South, Minneapolis 1, Minn.* All-purpose grinding wheel is said to grind any kind of material. It is said to work equally well for heavy fast roughing cuts and fine finishing. The wheels are available in straight, recessed one side, and recessed two sides models. Sizes range from 1 to 14 in. in diameter by ¼ to 8 in. in thickness.

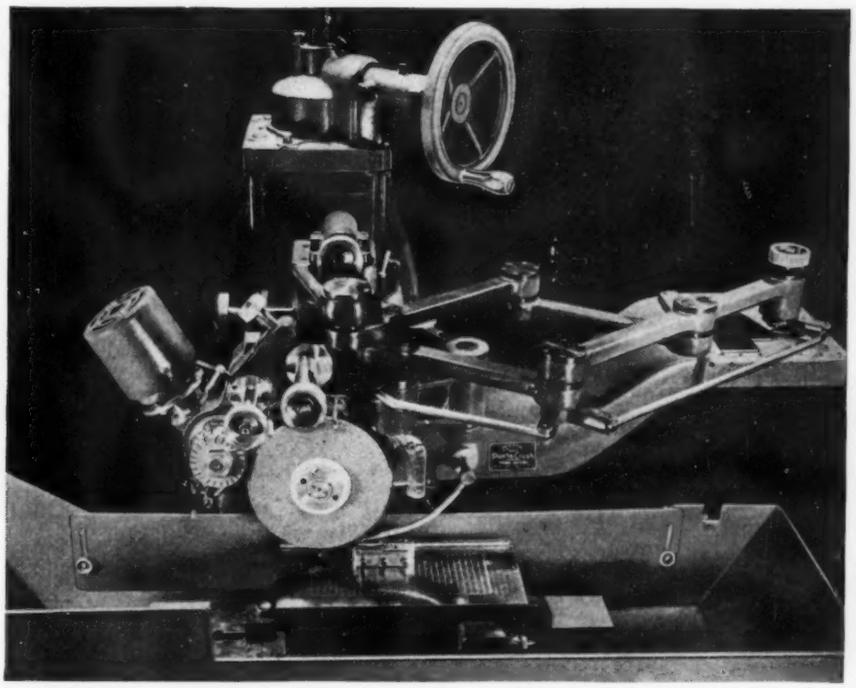
GRINDING WHEEL — *American Emery Wheel Works, Providence, R. I.* V-Eight grinding wheel is of porous structure but is claimed to hold its corners even under heavy cuts and to perform efficiently in dish and cup shapes.

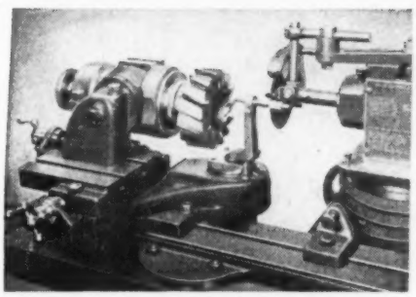
GRINDING WHEELS—*Bay State Abrasive Products Co., 21 Union St., Westboro, Mass.* Bayflex wheels, in which the abrasive has been incorporated in a cotton-fiber bonding material are designed for faster cutting of non-ferrous metals with less danger of wheel breakage.

DIAMOND COMPOUND — *Engis Equipment Co., 431 South Dearborn St., Chicago 5, Ill, and Sapphire Products Div., Elgin National Watch Co., 932 Benton St., Aurora, Ill.* Hyprez Diamond Compound contains only finely graded, pure diamond powders in a scientifically developed vehicle. Particles are exactly graded to definite standard specifications, evenly distributed, and permanently suspended.

ABRASIVE—*Norton Co., Worcester 6, Mass.* Alundum abrasive for use in wet-tumbling operations, is available in four size groups: ¼ to ½ in., ½ to ¾ in., ¾ to 1 in., and 1 to 1½ in. dia., either untumbled or with the sharp corners rounded off by tumbling.

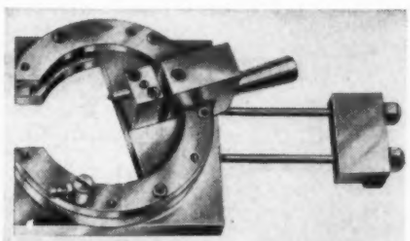
DIAMOND FILES AND HONES—*Wendt-Sonis Co., Hannibal, Mo.* A new line of Diamond "R" files and hones for dressing carbide cutting tools. A 100 concentration of diamonds is contained in a metal bond which is said to maintain a flat surface throughout the service life of the tool.





RADIUS DRESSER—*Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* The No. 2 radius-grinding attachment has been redesigned to include a direct reading micrometer gage for accurately adjusting the slides, and a large antifriction trunnion to provide a smooth swiveling motion.

ABRASIVE—*Norton Co., Worcester, Mass.* A new aluminum oxide product, 32 Alundum, produces abrasive grains of improved shape and structure. The crystals form individually in a chunky, nubbly shape. Formed in a special electric furnace process in a fluid matrix, they are separated from the matrix without crushing.



RADIUS DRESSER—*J. R. Fish Research & Engineering Co., 1341 Main St., Agawam, Mass.* The dresser clamps across the grinder ways in the position of the work in relation to the ways. With adaptors such as diamond-carrying dovetails, it is possible to produce contours, angles, grooves, steps and radii on the grinding wheel.

WHEEL DRESSER—*Moore Special Tool Co., Inc., 740 Union Ave., Bridgeport 7, Conn.* Pantographic diamond form wheel dressing is combined with roll crushing in the Panto-Crush Wheel Dresser. The pantograph has a 10 to 1 ratio between follower and diamond tool. Irregular forms can be dressed repeatedly once the templet is installed. The only skill needed is in the preparation of the templet.

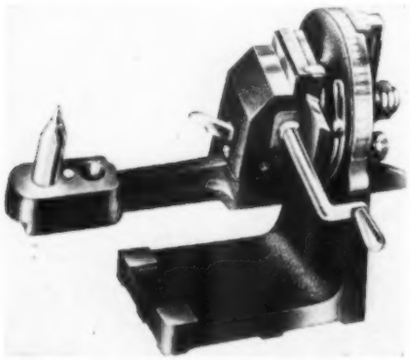
DRESSER—*G. J. Wallen Mfg. Co., 617 Bryant St., San Francisco 7, Calif.* Forced-feed lubrication in the Samson grinding wheel dresser prevents grit from feeding back into the dresser. The No. 1 size is used on wheels up to 12 in. diameter, and 2 in. face. The No. 2 dresses wheels up to 60-80 grit with diameters 3 in. and larger.

WHEEL DRESSING FIXTURE—*Allied Machinists, 6 Water St., Waltham, Mass.* A tool and wheel dressing fixture, Gem-Flex is said to offer accuracy equal to the height gage. It can be used to form any angle and a number of inside and outside radii.

TURRET DIAMOND HOLDER—*Diamond Tool Co., 938 E. 41st St., Chicago 15, Ill.* Sheldon Booth automatic, self-centering, turret diamond holder can be used in the adapter of a center grinder or with a magnetic block on a surface grinder. Angles of 30°, 20° and 10° are available on the three faces of the turret.

DIAMOND TOOL—*J. R. Fish Research & Engineering Co., 1341 Main St., Agawam, Mass.* Double diamond tool is inserted between centers to dress the wheel in actual working position, producing the step necessary for grinding two shaft diameters. This is said to eliminate errors caused by moving the carriage in the customary way.

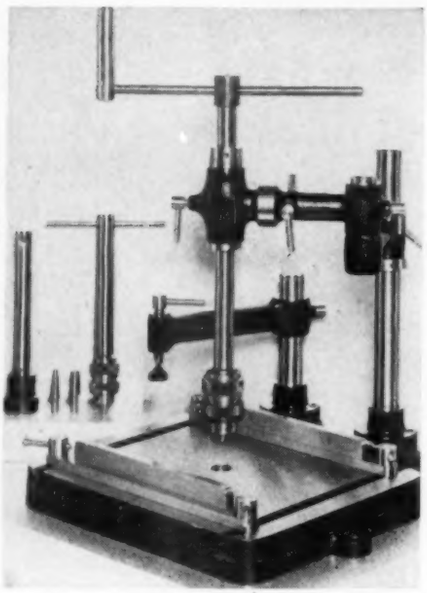
CRUSHED-PROCESS DRESSER—*Mechanical Wheel Dresser Co., 4810 Whitfield Ave., Detroit 4, Mich.* A multi-disk crushed-process dresser for trueing and dressing Cincinnati centerless grinding wheels.



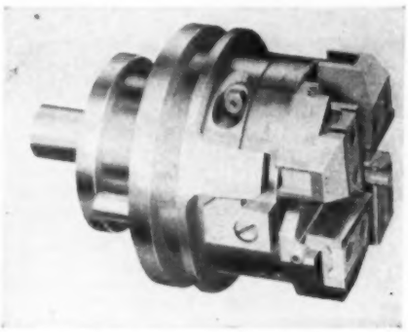
CONTOUR DRESSER—*Golconda Diamond Products Corp., 3414 N. Knox Ave., Chicago 41, Ill.* Bley Contour Dresser is said to redress grinding wheels at a tolerance of less than 0.0005 in. It can be used to shape grinding wheels up to 14-in. diameter with 3-in. radii.

SPECIAL TAPS—*Detroit Tap & Tool Co., 8432 Butler Ave., Detroit 11, Mich.* Holes in the front end of heat-treated crankshaft forgings are tapped with special ground tap which distributes the cutting load over a 3½ thread chamfer on six straight flutes. Eccentric relief is minimized. Production is said to average 700 pieces between grinds.

TAPS—*Detroit Tap and Tool Co., 8432 Butler St., Detroit, Mich.* A chrome-cobalt, high-speed steel specially developed for taps and threading tools, known as M-11, is used for line of standard and special taps. The new steel is said to have higher resistance to abrasion and higher torsional strength.



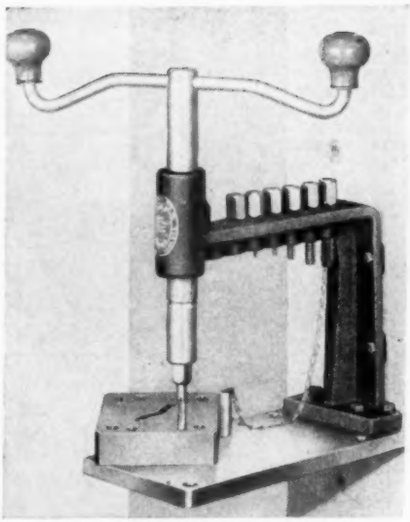
TAPPING FIXTURE—*Wolco Tool Div., 721-25 Custer Ave., Evanston, Ill.* Allman universal precision tapper weighs 40 lb., has a working surface 10 x 12 in. Maximum distance between working surface and tap is 6½ in. The depth of throat is 4½ in. An extension arm can be used to increase this to 8¼ in.



DIEHEAD — *Landis Machine Co., Waynesboro, Pa.* A 9/16-in. Lanco taper attachment diehead, with a capacity of ⅛ to ½ in. standard pipe threads, is of the rotary type and adaptable to any machine having either a leadscrew or lead cam. It can be furnished with special shank and flange for adapting to different machines.

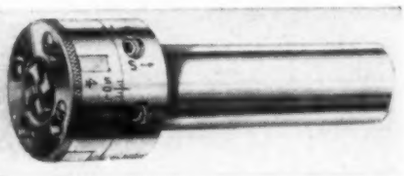
THREAD DIES—*Jones & Lamson Machine Co., Springfield, Vt.* Ground-thread flat rolling dies are available in lengths to 10 in. and widths to 8 in. A standard type of starting and leaving end has been established for the short die. All dies are matched, and the elimination of shims speeds up set-up time.

ELECTROLIZED TAPS—*Electrolized Tap Corp., 148 W. River St., Providence, R. I.* Line of high-speed taps treated by process which combines high voltage with chemical bath and a rare metal to produce a case of 83C Rockwell hardness.

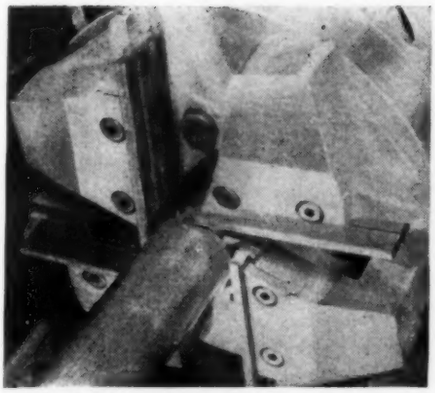


HAND TAPPING GUIDE—*Dahlstrom Mfg. Co., 420-G S. Sixth St., Minneapolis 15, Minn.* Simple guide for hand tapping than can be fastened to a post or bench is equipped with seven adapters ranging in size from 8/32 to ½ in. It has a table size 6 x 10¼-in., a 7½-in. throat depth, and a 7-in. opening.

HAND TAPPING UNIT—*Viking Tool & Machine Corp., 10 Main St., Belleville 9, N. J.* Hand tapper has adjustable arm easily raised or lowered, and swung to right or left, to increase flexibility and reduce amount of resetting. Work up to 10 in. in height can be handled.

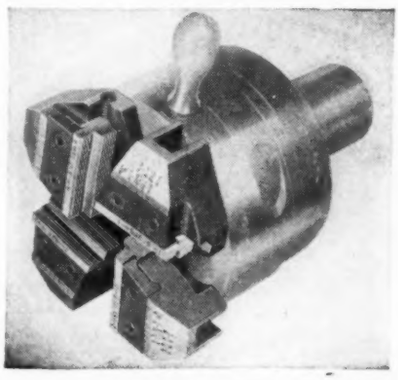


DIEHEAD—*The Geometric Tool Co., New Haven 15, Conn.* The Style EJ5 Diehead has been redesigned. The changes make it more compact and lighter, and give it greater accuracy. Steel retaining rings have been substituted for the cam-retaining keys and screws. The model for Swiss-type automatics weighs only 2 oz. instead of the former 3 oz.

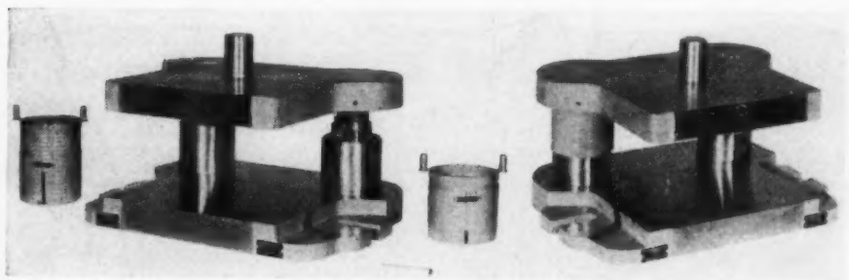


CENTERING THROAT CHASER—*Landis Machine Co., Waynesboro, Pa.* A Centering Throat Chaser for work that must have threads concentric with the outside diameter is especially adapted to threading long length threads of coarse pitch. The chaser eliminates the out-of-round condition that may exist when long work pieces are threaded.

DIEHEAD—*Jones & Lamson Machine Co., Springfield, Vt.* Automatic self-opening die head has a threading capacity range from 2½ to 4 in. for heavy duty threading and up to 4½ in. for 8-pitch threads and finer. Chasers are ground in the thread form after hardening.



THREAD CHASER—*Landis Machine Co., Waynesboro, Pa.* This tangential-type ground thread chaser for two diameters has all surfaces and the thread form ground after hardening and will hold a class three fit on the two diameters. Threads produced on each diameter must be of the same form and pitch, and should be of fairly short length.



DIE SET—*Lempco Products, Inc., Dunham Rd., Bedford, Ohio.* Anti-friction die set has preloaded ball or roller bearings between guide pins and guide bushings. All surfaces are precision ground.

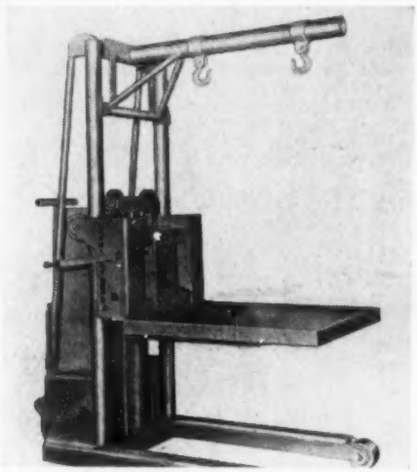
DIE CUSHION—*Dayton Rogers Mfg. Co., 2835 12th Ave. S., Minneapolis 7, Minn.* Pneumatic die cushion employs a molded synthetic rubber bellows in place of the conventional piston and cylinder air jack. The synthetic rubber bellows absorbs the die cushion travel of the hardened and ground pin pressure pad. It will stand working pressures up to 300 psi. Made in sizes from 5 to 12 in., having drawing capacities up to 5 in.

DIE CUSHION — *Dayton Rogers Manufacturing Co., 2835 12th Ave. S., Minneapolis 7, Minn.* Hydro-pneumatic die cushion gives draw-ring holding pressures up to 400 psi., with an 80 psi. air line. The die cushions are especially adapted for high ring-holding pressure in the drawing of thin stainless steel and other thin stocks when wrinkling is excessive.

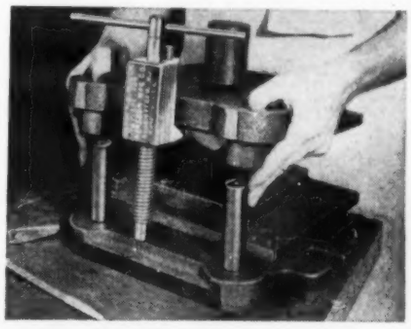
DIE CUSHION—*Dayton Rogers Mfg. Co., 2835 12th Ave. S., Minneapolis 7, Minn.* An improved pneumatic die cushion, Model L, may be mounted directly to the bottom of the bolster plate of the punch press. The press bed mounting allows the operator to remove the bolster plate without disturbing the cushion installation.

THREADING TOOLS—*Carboloy Co., Inc., 11149 E. Eight-Mile St., Detroit 32, Mich.* Standard carbide-tipped threading tools, Style T-15, are of the 60° V-nose type. Tips are of Carboloy grade 78-B, a tough, wear-resistant grade of carbide suited for long-run threading of steel parts.

THREADING TOOLS—*Metro Tool and Gage Co., 4240 W. Peterson Ave., Chicago 30, Ill.* Line of standard carbide-tipped threading tools, Style M-15, has a 60° V-nose with primary clearance of 3°, and secondary clearance of 6°.



DIE SEPARATOR — *Lyon-Raymond Corp., 2570 Madison St., Greene, N. Y.* This die separator consists of a removable boom with adjustable hooks. The top section of die is fastened by chains to the hooks and lowering the platform accomplishes the separation.

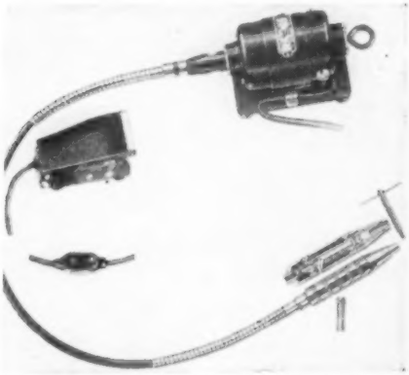


DIE JACKS—*Persson Mfg. Co., 2 Henry St., Bloomfield, N. J.* A safety die jack to separate die sets. A single operator can elevate the punch holder to any desired height because of its light weight.

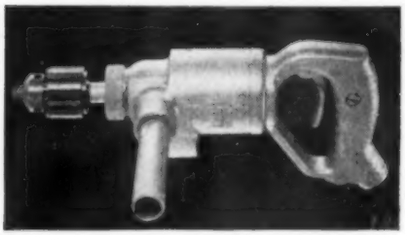
COMPACTING DIES—*Jessop Steel Co., Washington, Pa.* Carbide-inserted compacting dies, called Malta, are furnished in sizes from ⅛-in. solid drilled dies, guides, and bushings, to 36-in. inserted drawing dies.

HOLE-PUNCHING UNITS — *Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y.* Pierce metal up to ¼ in. thick. These units are the first Wales dies with a capacity for punching holes in metal more than ⅛ in. thick. Holder width is increased to ¾ in. diameter.

FLEXIBLE-SHAFT TOOL — *Dumore Company, Racine, Wis.* A flexible-shaft utility tool weighing 8 lb. The 1/15 hp. motor is hung on a hook and a foot rheostat controls the speed. The flexible shaft is 36½ in. long with a speed of 500 to 10,000 rpm.



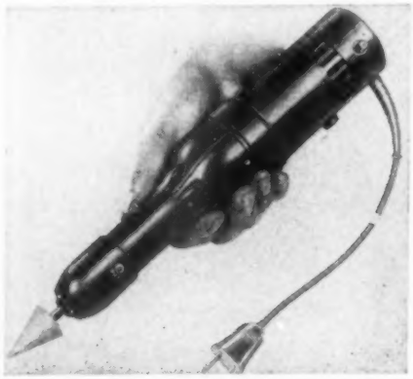
FLEXIBLE-SHAFT GRINDER — *Spring Specialty Co., 1219 W. Madison St., Maywood, Ill.* Leigh VB-2 will operate at a speed in excess of 17,000 rpm., and mounts points, polishing disks, drums, and wheels to 1-in. diameter. The spindle has a key-operated ¼-in. collet but can also be provided with insert reducing collets.



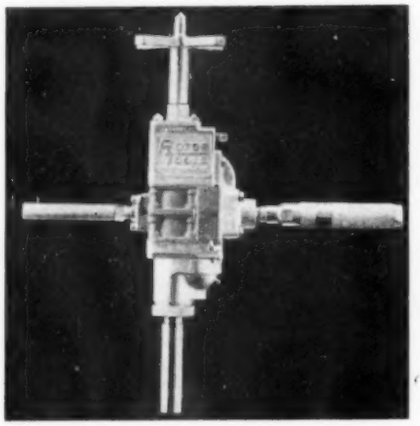
AIR DRILLS—*Rotor Tool Co., Cleveland, Ohio.* Two small air drills, the Midget type M-850 and the E-O-M-1100. The Midget type has a capacity of 1/16, ⅛, and 3/16 in. for drilling and light screwdriving and nut setting. The E-O has a capacity of ¼, 5/16, and ⅜ in. for drilling, and for setting nuts and hex-head machine screws.

FLEXIBLE-SHAFT GRINDERS — *Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill.* Universal Hy-Speed grinder can be set on a bench, hung from a hook, or suspended from the operator's belt. Model 00-U is ¼ hp. and has a free speed of 16,000 rpm. Model 000-U2 is 1/10 hp. with a free speed of 18,000 rpm. Model 000-U1 has a free speed of 15,000 rpm.

PNEUMATIC PEENING HAMMER—*Aro Equipment Corp., Bryan, Ohio.* An air-powered peening and scaling hammer, Model 7002, can be used for removing scale and rust from welded parts, or for removing sand on small castings, and peening tubular rivets. The tool delivers 5,000 blows per min.

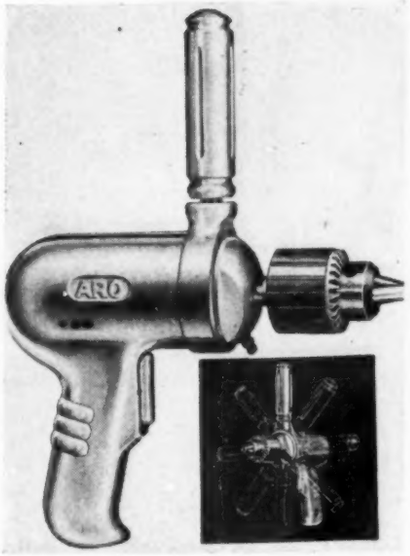


ELECTRIC HAND TOOL—*Precise Products Co., 1328-30 Clark St., Racine, Wis.* Electric hand tool and portable grinder, Precise-40, is capable of speeds to 40,000 rpm. The tool has a 1/5 hp. motor and weighs 40 oz.

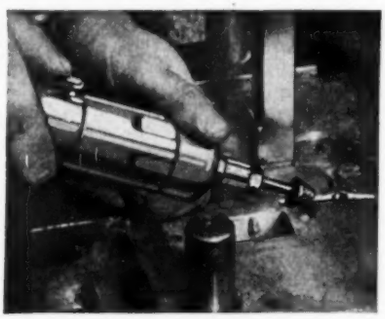


AIR DRILLS—*Rotor Tool Co., Cleveland, Ohio.* Air drills in two intermediate sizes, E-22 and E-42 use the same motor and have many interchangeable parts. Magnesium is used in both tools to keep the weight down. Model E-22 has a capacity of 9/16 in. for drilling. Model E-42 has capacity of 9/16 and ⅞ in. for drilling.

IMPACT WRENCH — *Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6, Ill.* Thor pneumatic impact wrench for driving and removing nuts, bolts, and tap screws up to ¾-in. thread size has rotatively striking impact jaws set at a wide radius from the spindle center to reduce stress, and a short, rigid spindle shank.

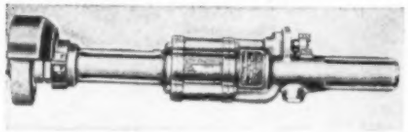


AIR-POWERED DRILL—*Aro Equipment Corp., Bryan, Ohio.* A ½-in. drill, Model 7016 is equipped with an auxiliary handle which can be located to any position around the nose of the tool. With an over-all length of 8⅝ in., the drill weighs 6¼ lb.

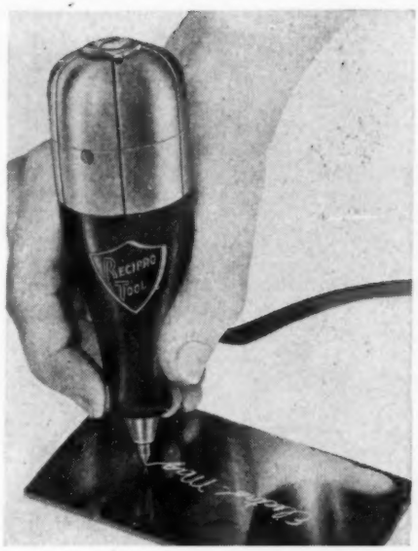


PNEUMATIC GRINDER—*Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* Small pneumatic file and die grinder weighs 16 oz. A vane-type motor is used which is said to maintain its speed even under heavy loads. Wheels up to 1½-in. diameter may be handled by the grinder.

AIR GRINDERS — *Madison-Kipp Corp., Madison 4, Wis.* Featherweight grinder models use aluminum and magnesium for such parts as housings, back plates, rotors and lock nuts. Model JA is a turbine-type tool taking wheels up to ⅞ in. in dia. Model TT is also a turbine-type tool taking wheels up to 1¼ in. in dia. Operating on the vane-type principle, Model PVT takes wheels up to 2½ in. in diameter.

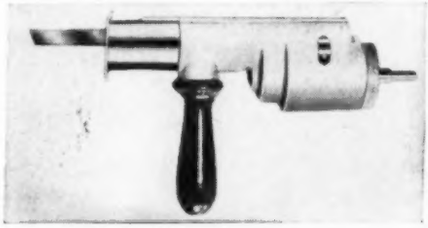


HORIZONTAL GRINDERS — *Master Pneumatic Tool Co., Inc., 2100 Keith Bldg., Cleveland, Ohio.* A line of horizontal grinders which includes eight models is made in 4-, to 8-in. sizes.

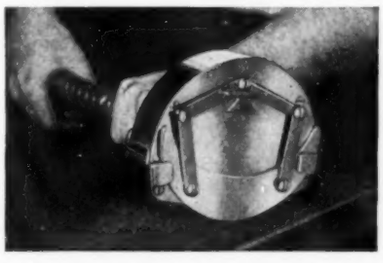


ENGRAVING TOOL — *Electro-Mag Mfg. Co., 315 So. Madison St., Rockford, Ill.* The tool delivers a 5¼ lb impact with 7,200 power strokes per min. Adjustable from 0 to ⅛ in. The tool is available with a variety of hardened alloy steel bits or with diamond tips.

PNEUMATIC SCREW DRIVER—*Aro Equipment Corp., Bryan, Ohio.* Model 7000 is designed especially for driving small screws. Capacity includes screws from No. 1 to No. 6. It weighs 8 oz. and is 4⅞ in. long and ¾ in. in dia. It starts automatically when applied to the work.



SAW—*Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill.* Wyco Hy-Speed saw uses ordinary hacksaw blades and standard ¼-in. shank machine files. Can be attached to any ¼ in. electric drill, air drill, or flexible shaft. The unit can be chucked in a drill chuck or collet.

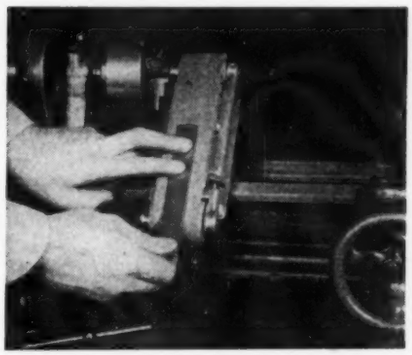


GUARD—*Flohr Mfg. Co., Buffalo 17, N. Y.* A radial guard for portable wire brushes and emery wheels completely covers the wheel with the exception of the working surface. It is available in 6 and 8 in. sizes.

PNEUMATIC GRINDER—*M-B Products, 130-134 E. Larned St., Detroit 26, Mich.* Small, "Junior" pneumatic grinder, weighs only 12 oz., and operates at speeds to 75,000 rpm. A simple valve for control of air will remain in any set position to control grinder speed.

PNEUMATIC GRINDER — *Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* Using a vane-type motor, the pneumatic file and die grinder is rated at ¼ hp., and 19,000 rpm. Maximum wheel diameter is 1½ in.

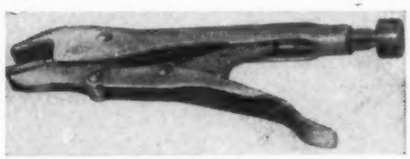
AIR GUN—*Air-Way Pump & Equipment Co., 569 W. Van Buren St., Chicago 7, Ill.* A method for direct attachment of the air hose without using special tools has been incorporated in the Air-O-Chek air gun.



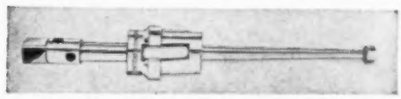
PORTABLE BELT SANDER—*Johnson Mfg. Co., Lincoln Park, R. I.* A portable sander incorporates all the principles of a belt sander except the power plant. The frame is constructed of aluminum and uses standard belts. It can be mounted in a lathe or drill-press or powered by a portable tool.

SOFT HAMMERS—*Gregory Tool & Mfg. Co., 5300 Tireman, Detroit 4, Mich.* One model has a replaceable copper or brass head, the other replaceable brass or copper tips. Each type has 1¾-, 2- 2¼, or 2½-in. dia. heads and weighs from 4½ to 10½ lb.

MACHINE FILE—*Henry Disston & Sons, Inc., Philadelphia, Pa.* A light-weight cemented carbide file for bronze, brass, and hardened steels has a carbide insert supplied by the Carboloy Co.



HANDY WRENCH — *A.C.E., Inc., Transportation Bldg., Detroit 26, Mich.* Toggle action enables a new wrench to be used as a combination straight, end or pipe wrench vise, toggle press clamp or pliers. Jaw opening is 1¼ in.

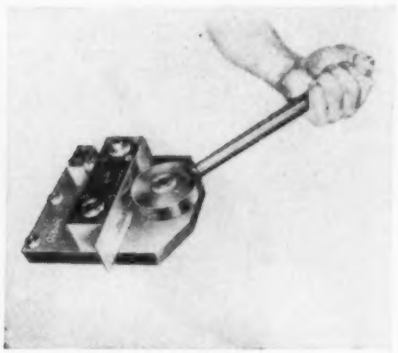


TUBE EXPANDER—*Richard Dudgeon, Inc., 24 Columbia St., New York 2, N. Y.* Model 16 tube expander may be dismantled and new rolls quickly inserted. Rolls are set at an angle with the mandrel for self-feed.

SOFT HAMMER — *Danielson Mfg. Co., Danielson, Conn.* A soft hammer with faces of nylon is now available in 2/3- and 2-lb. sizes. The replaceable nylon faces are said not to chip or mushroom.

BLADE HOLDER—*A. D. McBurney, 939 W. 6 St., Los Angeles 14, Calif.* To utilize broken lengths of hack-saw blades and thin flat file sections, the Super blade holder is a tubular handle with an extended positive-grip nose to secure working point of a blade or file.

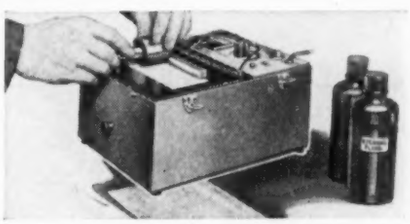
HACKSAW FRAME—*K-D Mfg. Co., Lancaster, Pa.* All-steel hacksaw frame, No. 99, will get into narrow openings down to 3/16 in. Stops are provided on the frame to fit 3, 4½, 6, 10 and 12-in. blades. Broken blades can be used by annealing and drilling a new hole on any of these centers.



MARKING UNIT—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Model 920 Hand Marking machine for marking flat parts with a simple change in construction will mark round parts. Working adjustment is obtained by means of a screw and lock-nut, set beneath the locking bolt end of the arm.

STAMPING MACHINE—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Acromarker No. 1AR is similar to an arbor press with the lettering and numbering head set in the lower end of the ram. The pressure stroke for lettering and numbering is 3/32 in., applied by swinging a lever at the front of the machine.

NUMBERING HEAD — *William A. Force, 216 Nichols Ave., Brooklyn 8, N. Y.* Selective-type numbering head for stamping metal parts, Model 27 has each wheel controlled by an individual lever, so that any desired number can be set.



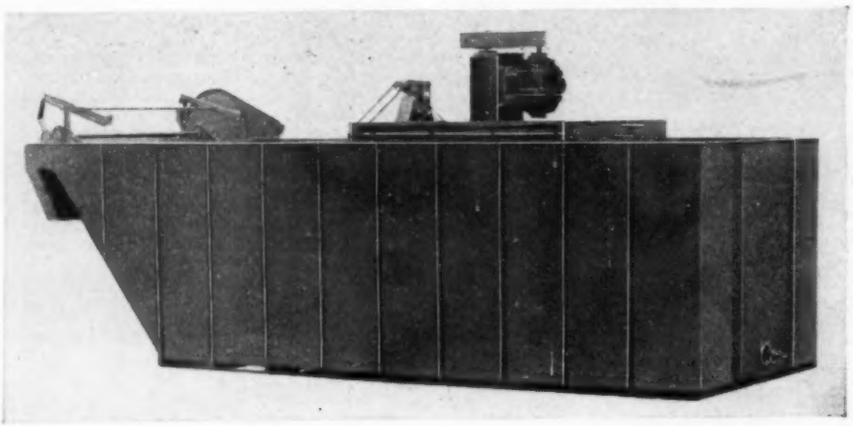
PRODUCTION MARKING UNIT—*Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* A device for production marking, the E-Z Mark Etcher, marks most metals in one to three seconds. Work with round or flat surfaces can be marked. Impressions are made on the stencil with typewriter, pen, pencil, or stylus.

MARKING TOOLS—*William A. Force & Co., 216 Nichols Ave., Brooklyn 8, N. Y.* Marking tools and dies are supplied with an ebony finish. This glossy black finish provides a protective coat which prevents deterioration.

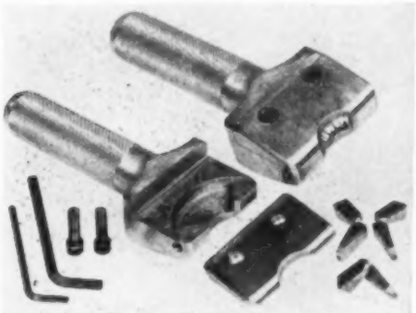
MARKING INKS—*Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Inks for marking plastics, rubber, and insulated wire and cable are available in a variety of colors in either liquid or paste form. The inks are designed to penetrate the surface and dry in a flexible state.

FIGURE STAMPING—*Acromark Co., 713 Morrell St., Elizabeth 4, N. J.* An improved heavy screw in the Model 1 Acromarker gives sufficient power to stamp stainless steel to the required depth in sizes from 1/16 in. to 3/16 in. When polished surfaces are stamped the characters need enamel filling and the improved machine gives the depth necssary.

MARKER—*James H. Matthews & Co., 3942 Forbes St., Pittsburgh, Pa.* The Airgrit marking machine is for parts with a ground or mirror surface that should not be marred or distorted. A short blast of fine grit against rubber or celluloid stencil masks, produces a light, clear impression without a blurred surface.



STAMPING MACHINE — *Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Improvements in the Model 1F nameplate stamping machine include a multiple lever and cam foot pressure arrangement which increases the foot power six to eight times. Character spacing adjustment can now be made.



CONVEX MARKING DEVICES—*New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Mich.* Convex marking device has interchangeable type held in place by steel plate attached to the body of the holder with two set-screws.

PRINTER—*Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Stamped size numbers can be filled with ink or enamel in the Acro Printer No. 600S. The ink or enamel is saturated into a special felt cut in the form of a ring and set in a brass cup shaped form that can be rotated from a central axis to maintain a fresh supply of ink.

REFRIGERATION UNITS — *United States Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.* Refrigeration units for control of coolant temperatures are designed for use in precision operations. The equipment is designed for operation under shop conditions, and is available either with immersion coils or with heat exchangers.

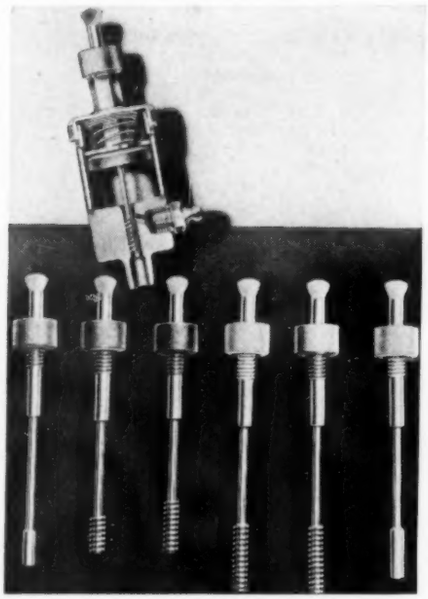
DRAWING COMPOUND—*Texas Co., 135 E. 42nd St., New York 17, N. Y.* Texaco Drawing Compound No. 2, adapted for stamping and drawing operations, has a paste-like consistency and is said to be easily washed from the completed work with water.

GRINDING FLUID—*Quaker Chemical Products Corp., Conshohocken, Pa.* Micro-grind 70 is a practically odorless, pink-colored, low-viscosity liquid which will form a true solution with water of all hardnesses. The fluid is said to have a highly detergent action on abrasive wheels.

WATER-SOLUBLE LUBRICANT — *White & Bagley Co., Worcester, Mass.* A liquid-type, water-soluble lubricant called Economy Lubricant No. 1888 is said to present unusual detergent properties and may be used for both grinding and cutting operations.

MULTIPLE OILER — *William W. Nugent & Co., Inc., Chicago, Ill.* Heavy-duty multiple oiler with a reservoir capacity of three pints is designed for any machine that requires drop feed or small stream. It is available with a string of sight feed valves in multiples of from 2 to 23 feeds.

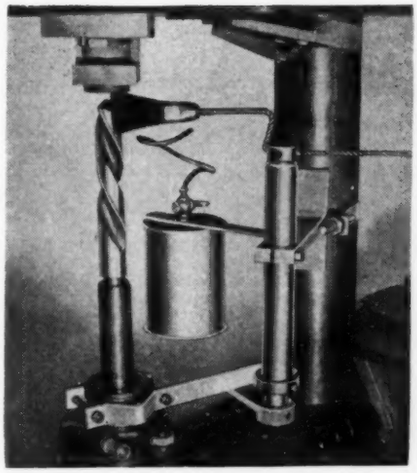
COOLANT CLARIFIER — *United States Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.* A process for removing waste solids from coolant which consists of soluble oil and water consists of a simple tank, a rotor-stator agitator, and a source of power. Air bubbles throughout the liquid, attach themselves to solid particles, carry them to the surface, and concentrate them in a froth.



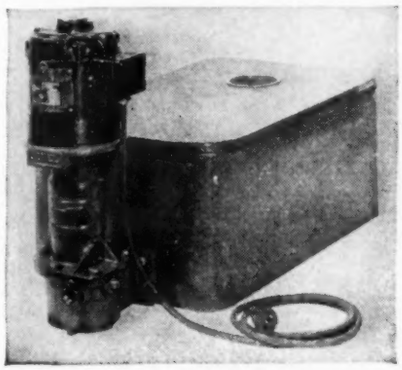
LUBRICATORS—*Gray Co., Inc., 60 11th Ave., N. E., Minneapolis 13, Minnesota.* Pressure-filled Gun-Fil lubricators dispense oil or grease in a measured, uniform flow to a moving bearing, and stop feeding when the bearing is motionless. They are available in four sizes with lubricant capacities from ½ oz. to 8 oz.

COOLANT CUP—*The Tru-Punch Co., Box 14, Kingsbridge Station, New York 63, N. Y.* Reservoir for coolant or cutting oil can be quickly attached to any lathe, milling machine, grinder, drillpress, or other metalcutting machine. Flow can be closely controlled or shut off as desired.

LUBRICATING SYSTEM — *Trabon Engineering Corp., Cleveland, Ohio.* All bearings on one or several machines may be lubricated manually or automatically from a central pumping point. From 2 to 22 bearings can be served by a single feeder. A variety of feeder section sizes service widely varying bearing sizes.



LUBRICATING DEVICE—*Charles L. Jarvis Co., Middletown, Conn.* Lubro-Brush automatically lubricates and brushes tools. A cam-action in the vertical tube of the unit transfers a short lift of the drill-press spindle into a sweeping action of the brush.



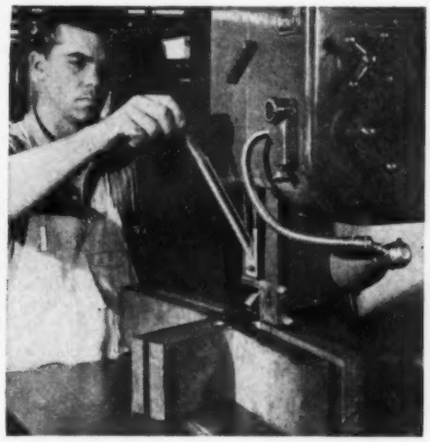
COOLANT PUMP—*Delta Manufacturing Div., Rockwell Mfg. Co., 600 E. Vienna Ave., Milwaukee 1, Wis.* Coolant pump will deliver up to 300 gpm. at low heads. The flat machined flange is said to permit use on most machine tools. A totally inclosed motor of ¼-hp. capacity has bearings which are lubricated for life.

GEAR LUBRICANT—*The Texas Co., 135 E. 42nd St., New York, N. Y.* Lubricant which is brushed and sprayed on open gears, Texaco No. 2-X Fluid, contains a base material which has high adhesiveness, and which is cut back with a non-inflammable solvent. The result is said to be a lubricant which is both efficient and easy to apply.

CUTTING OIL—*The Texas Co., 135 E. 42nd St., New York, N. Y.* Texaco Soluble Oil Heavy Duty is said to have the cooling properties of soluble oils combined with the high-speed cutting characteristics of sulfurized mineral oils, permitting higher cutting speeds.

DIE-CASTING LUBRICANT—*G. W. Smith & Sons, 5400 Kemp Road, Dayton 3, Ohio.* Die Slick No. 11 is a colorless, odorless compound applied as a mist spray to the die. The lubricant prevents formation of zinc oxide on the core pins and die cavities and is said to eliminate scoring and sticking.

CUTTING OILS—*The Texas Co., 135 E. 42nd St., New York, N. Y.* Series of transparent cutting oils, pale in color, with a pleasant odor and non-corrosive in high-temperature use, Cleartex Cutting Oils A, A-1, B, and DD, and Britex Cutting Oil B, contain certain war-restricted ingredients which improve their color and performance.

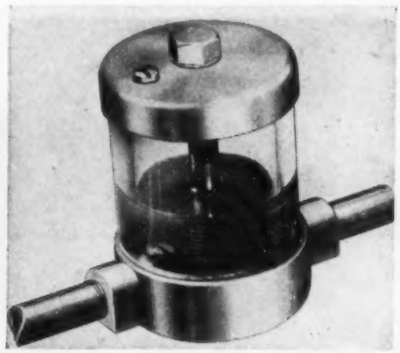


STICK LUBRICANT — *Monogram Manufacturing Co., Los Angeles, Calif.* Elf dry lubricant for drills and band-saw blades is compounded of turpentine, mineral oil, paraffin and other materials. For band-saw blades, an applicator can be used.

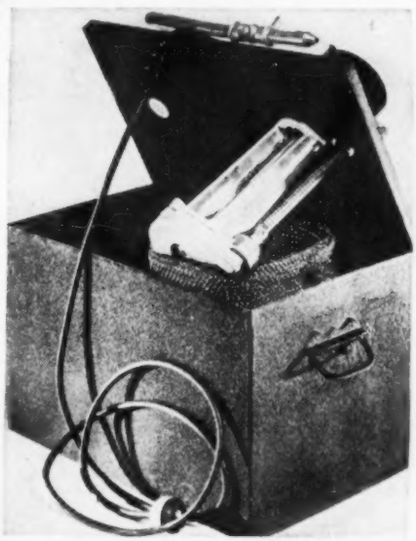
OIL PURIFICATION EQUIPMENT—*Honan-Crane Corp., 912 Sixth St., Lebanon, Ind.* The Centri-Power coolant filter is designed for stationary installation to replace or supplement machine-tool sumps. The mobile coolant filter is designed to remove, filter, and replace oils or coolants used in machine-tool operations. The sump cleaner is designed for the removal of oil, dirt and chips, from sumps or tanks of machine tools, gear cases, compressors, engines and quenching systems. The fourth unit is an oil-transfer truck and sump cleaner.

BAND SAW LUBRICATOR — *Do-All Co., 1301 Washington Ave. South, Minneapolis 4, Minn.* A spray lubricator that provides heat dissipation on high-speed bandsaws operates from the standard air-pressure line available in most machine shops. Th spray head straddles the saw blade from the back side and directs twin streams of lubricated air against the teeth of the saw.

CUTTING OIL BASES—*National Oil Products Co., Harrison, N. J.* Nopco 1009-C is recommended for steel, brass, and copper cutting operations in which frictional loads are extremely high. Nopco 1009-A is recommended for straight cutting operations on ferrous metal. Nopco 2009-A is used in mineral oil blends for rapid heat removal.



TOOL LUBRICATOR—*CCA Products Engineering, Box 671, Glendale, Calif.* Designed for automatic lubrication of pneumatic equipment, the CCA lube includes a transparent plastic window with 0 rings for top and bottom seals. Regulation of lubricant is accomplished by a needle valve.



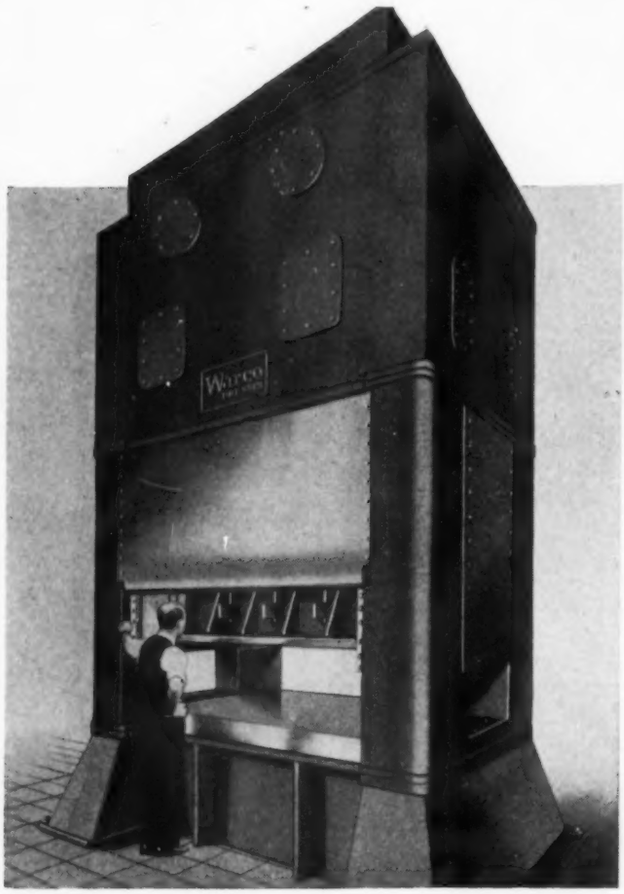
COOLANT FILTERING — *Inject-A-Flow Pump Co., 67 N. Willow St., Montclair, N. J.* A self-contained filtering system to remove metallic particles from coolant, is said to be adaptable to any machine tool, including grinders. The strainer is said to exclude fine particles without creating back pressure.

COOLANT SEPARATOR — *Barnes Drill Co., 814 Chestnut St., Rockford, Ill.* Magnetic-automatic coolant separators for honing and grinding machines are available from 5 to 100 gpm. where kerosenes or soluble oils are used. Magnets attract and hold to the rotating drum surface magnetized swarf from the coolant, including most of the suspended abrasive which the swarf strains out of a thin, wide counterflow of used coolant passing beneath it.

CUTTING OIL—*Rogers Laboratory, 257 Wooster St., New Haven, Conn.* A product called Miracle Fluid for lubricating drills, taps, dies and reamers, is said to prevent burning of cutting tools, and to be non-inflammable, non-explosive, and non-toxic.

SIGHT FEED VALVE—*Oil-Rite Corp., 3466 S. 13th St., Milwaukee 7, Wis.* A sight feed valve with an unbreakable plastic sight is for oil circulating systems. Oil flows past an adjustable port through a valve nozzle into the sight chamber.

Forming, Casting, Molding



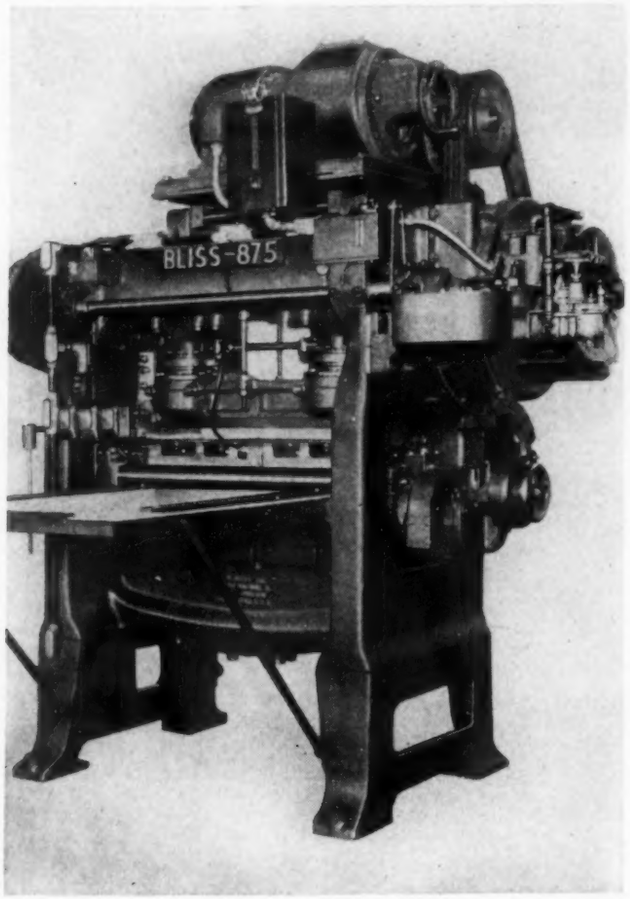
PRESSES—*Warren City Mfg. Co., subsidiary of The Federal Machine and Welder Co., Warren, Ohio.* All-steel welded presses include open-back inclinable presses, ranging in size from 50 to 150-ton capacity, a series of mechanical and hydraulic metal-working presses, with capacity from 100 to 200 tons, and mechanical press brakes in sizes from 100 to 500 tons designed to handle lengths up to 24 ft.

ARBOR PRESSES—*Studebaker Machine Co., 1221 S. 9th Ave., Maywood, Ill.* Two air-powered arbor presses of steel welded construction have double-acting air cylinders with up to 200 sharp punch press ram blows per minute possible. The Hurricane 6 develops 1-ton ram pressure at 80 psi. air line pressure. With 120 psi. air line pressure, 1½-ton pressure is developed. The Hurricane 8 develops 2 and 3 tons.

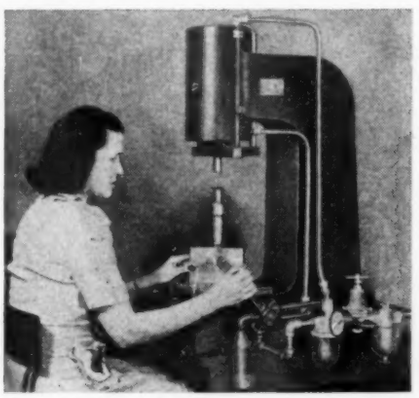
→

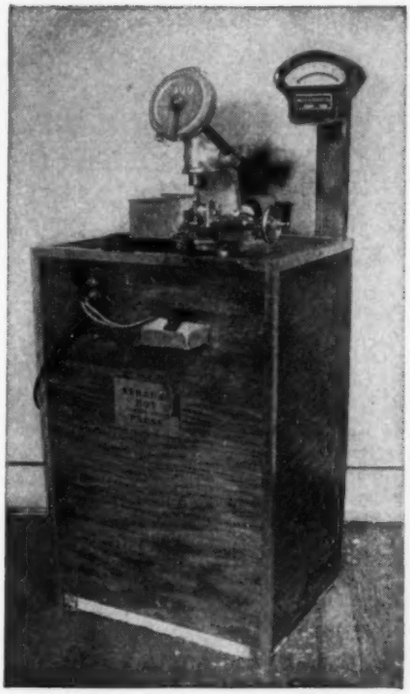
←

PRESS CALCULATOR — *Calculator Co., Box 65, Teaneck, N. J.* Calculator designed to simplify the selection of presses developed by Mr. Leonard B. Crary, is accompanied by a 70-page booklet which largely consists of reference tables. The calculator measures 9½ in. square and is made of Vinylite plastic.

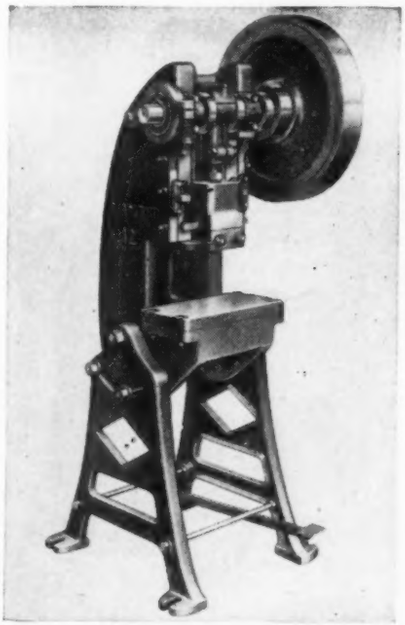


PERFORATING PRESS—*E. W. Bliss Co., Brooklyn 32, N. Y.* A perforating press designed for fine perforating operations requiring precision dies and extreme accuracy in the feeding mechanism has capacity of 75 tons. Special ratchets can be furnished for feeds as low as 0.010 in. The press will take sheets up to 40-in. width in the standard size.



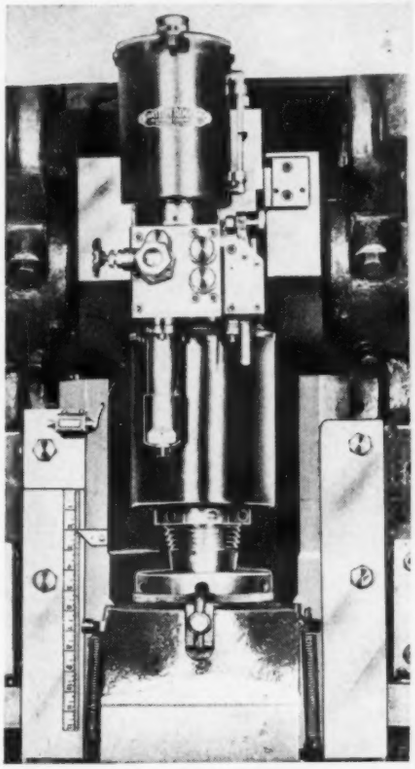


HOT PRESS—*National Diamond Hone & Wheel Co., 108 Fulton St., New York 7, N. Y.* Machine to hot press non-ferrous powder metal parts on a laboratory basis. Slugs 3/16 in. in diameter by ¼ in. long can be produced with a density approaching that of cast or wrought material. The completed piece can be produced in a minute or two as contrasted with a pressing cycle followed by long sintering.

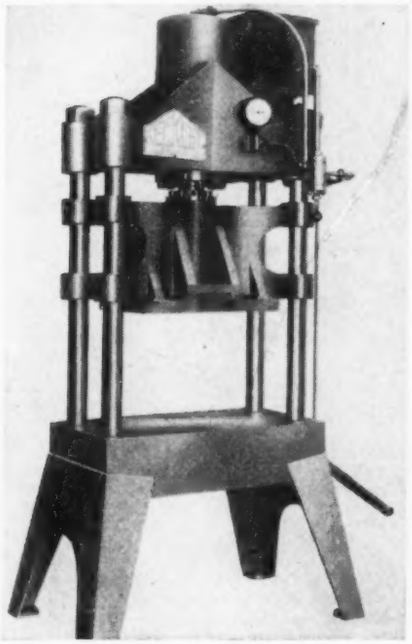


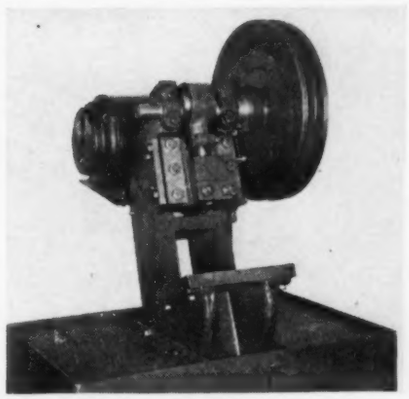
PUNCH PRESS—*Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif.* Two new power punch presses, No. 12 and No. 14 are of the open-back inclinable type, rated at 12 and 14 tons respectively. The presses have a 6½ in. opening in the back of the frame and will incline 40°.

HYDRAULIC PITMAN — *Dayton Rogers Mfg. Co., 2835 12th Ave., South, Minneapolis 7, Minn.* A hydraulic overload pitman to prevent overloading of punch presses in sizes of 30 tons up, is used to replace the standard pitman or connecting rod. The device is usually set to protect the maximum rated tonnage of the press, but may be adjusted to protect any given tooling.

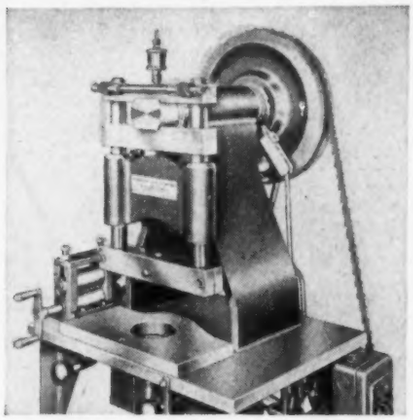


DIE TRY-OUT PRESS—*O. C. Keckley Co., 400 W. Madison St., Chicago 6, Ill.* Hydraulic die try-out press has a double-acting cylinder. The operator is said to be able to feel the punch entering the die. Pressure is available on the upstroke to spread the die. Maximum capacity is 75 tons with a 15-in. ram stroke. Distance between the platens is 18 in.

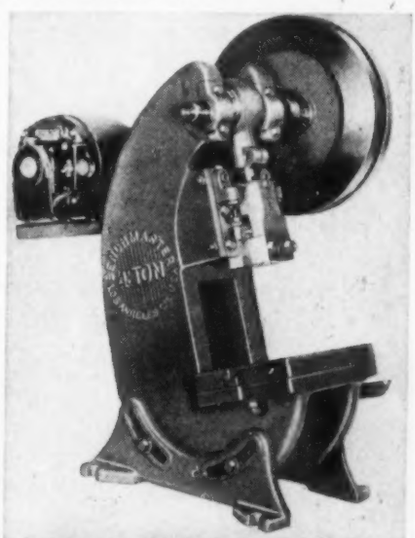




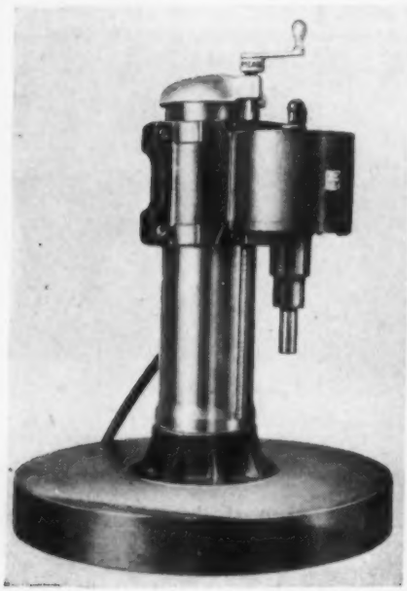
PUNCH PRESS—*William F. Brewer Machine Co., 75 Laurel St., Hartford 6,* Conn. A 6-ton heavy-duty punch press, the Hub, can be inclined 38° from the vertical. Mounted on a steel table, the press has a 1-in. stroke.



PUNCH PRESS—*Wooley Div., Hammel-Dahl Co., 233 Richmond St., Providence 3, R. I.* With speeds that can be varied from 200 to 500 strokes per minute, the "Hi-Speed" Peterson punch press is capable of producing 30,000 stampings per hour. The improved model uses a ¾-hp. motor operating at 1750 rpm.

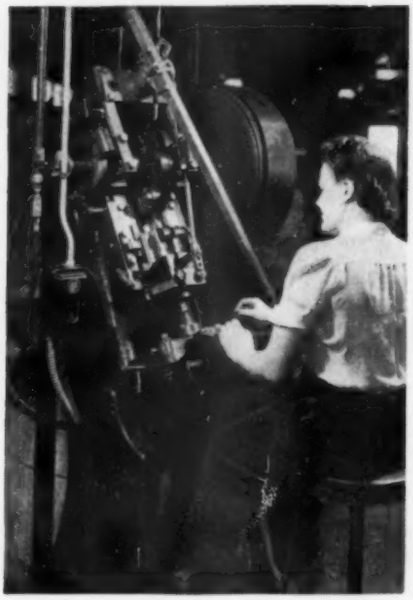


PUNCH PRESS—*Benchmaster Mfg. Co., 2952 W. Pico Blvd., Los Angeles 6, Calif.* Improved model of the 4-ton bench punch press weighs 215 lb. and operates at a speed of 285 rpm., with a 1725 rpm. motor.

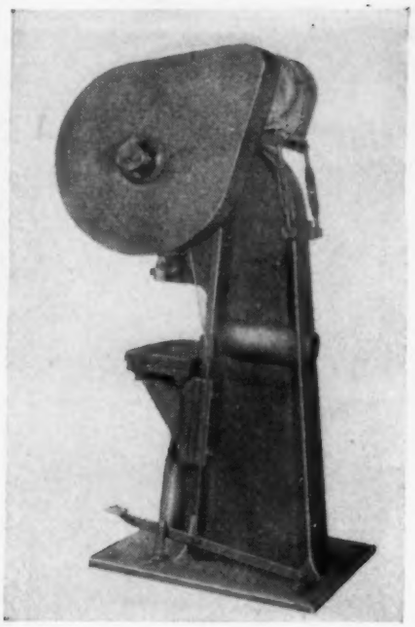


COLUMN PRESS—*Mead Specialties Co., 4120 North Knox Ave., Chicago 41, Ill.* This unit delivers a ram pressure of 3000 lb. on 110-lb. line pressure, is useful for small to medium runs where it is desirable to leave fixtures permanently mounted to the base. As many as a dozen small fixtures may be left permanently set up.

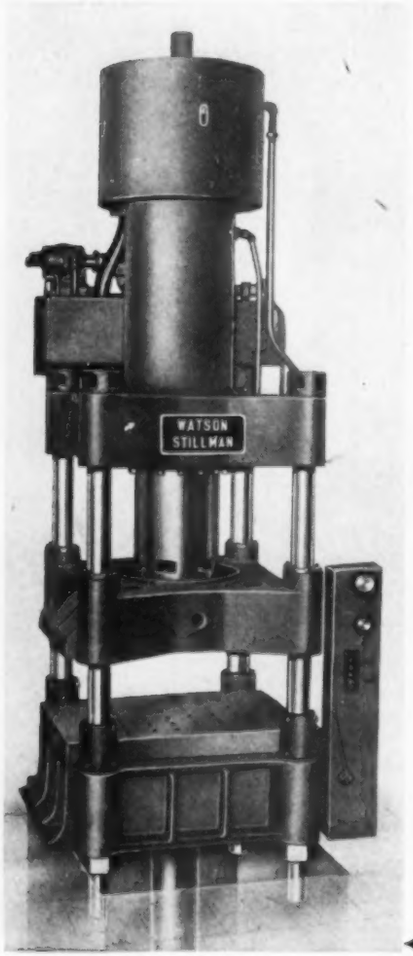
PUNCH-PRESS GUARD—*All American Safety Equipment Co., 11 S. La Salle St., Chicago 3, Ill.* Punch-press guard, the "Safe-Sweep," is attached to the ram head and can be adjusted to sweep the length of the bolster, or to operate between tie rods.



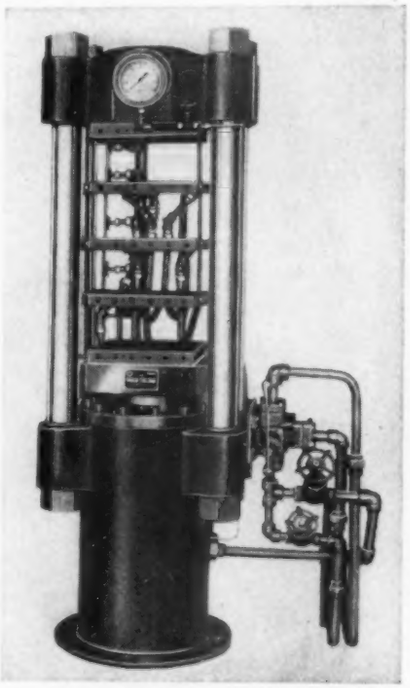
HEATING PRESS—*Watson-Stillman Co., 75 West St., Roselle, N. J.* A stop valve which locks pressure in suits this 150-ton press for plastic hot pressing and laminating. Operating pressure is 2400 psi., with a platen size 14x14 in. and a ram stroke of 16 in.

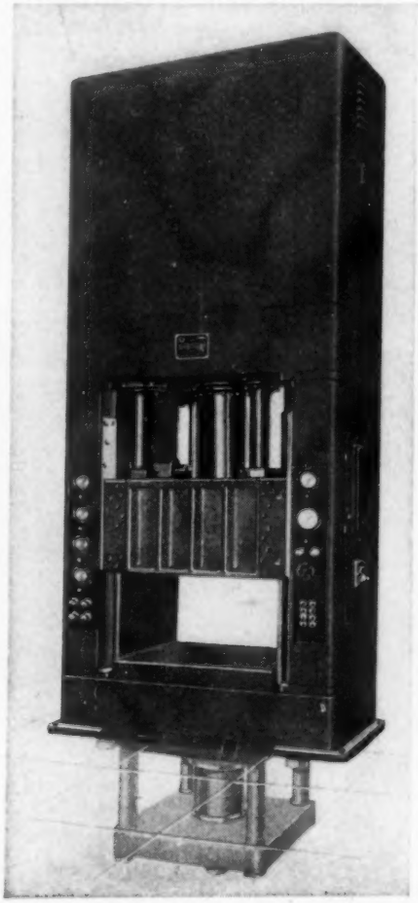


HORN PRESS—*Walsh Press and Die Division, American Machine and Gage Co., 4743 W. Kinzie St., Chicago, Ill.* An improved version of the No. 3 Horn Press has the motor mounted on top of the press. A shield completely protects employees from the motor, pulley, drive-belt, and fly-wheel.

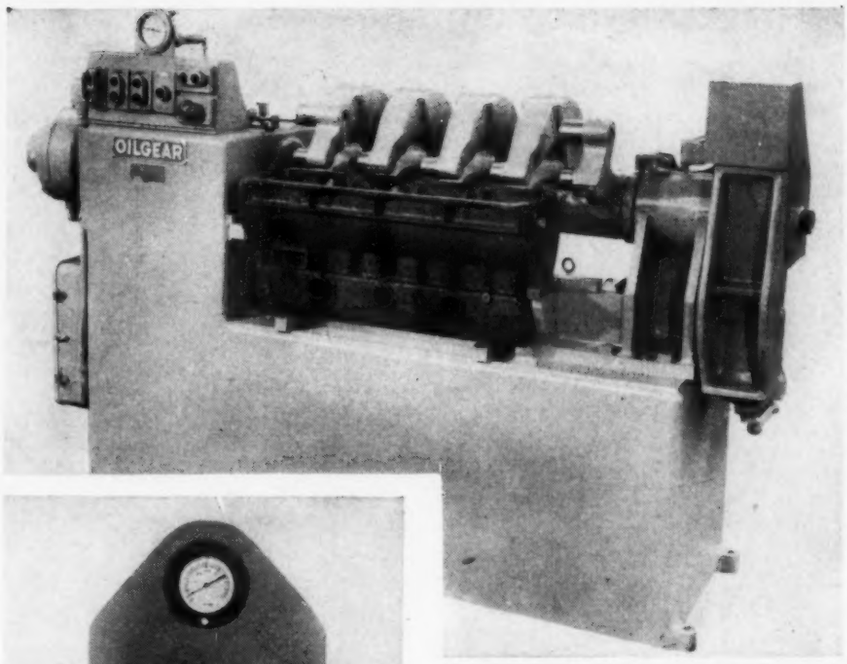


FORMING PRESS—*Watson-Stillman Co., Roselle, N. J.* An oversize die cushion is the feature of 500-ton forming press. The cushion has surface dimensions of 3 ft. 4 in., by 3 ft. 4 in. and adapts the press to larger and more varied loads than were previously allowable. The press advances and returns at a speed of 300 ipm. Speeds in compression are 30 ipm. to 250 tons and 8 ipm., above 250 tons.

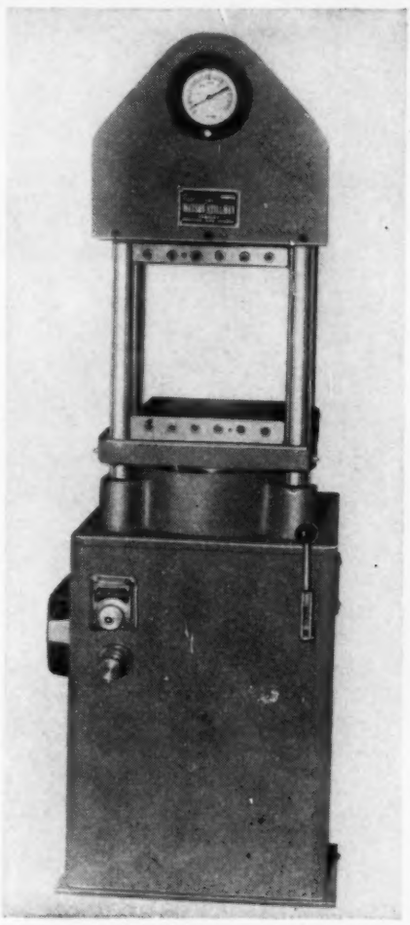




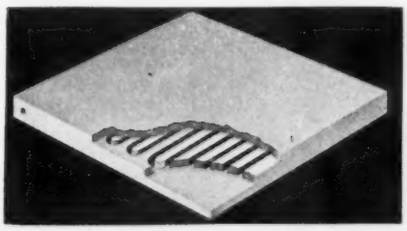
DRAWING PRESS—*Watson-Stillman Co., 75 West St., Roselle, N. J.* 250-ton, double-action, hydraulic press has a 36-inch operating stroke. The die ram is 11 in. in dia. with a 14-in. stroke.



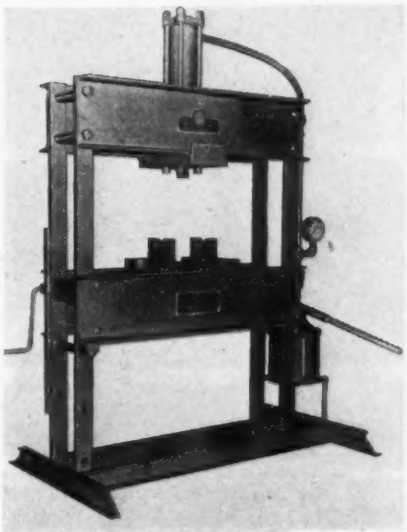
ASSEMBLING PRESS—*The Oilgear Co., 1301-1417 West Bruce St, Milwaukee 4, Wis.* Five different sizes of camshaft bushings are installed in eight-cylinder motor blocks in a single operation on the 15-ton camshaft bushing assembling press. On the new press, the operator merely slips camshaft bushings on pins and guides the block to assembly position.



GENERAL-PURPOSE PRESS—*Watson-Stillman Co., 75 West St., Roselle, N. J.* 40-ton general-purpose press for short production runs, testing purposes, or for hot or cold plastic molding. Pressure is controlled in ranges from 25% to full capacity by a microvalve.

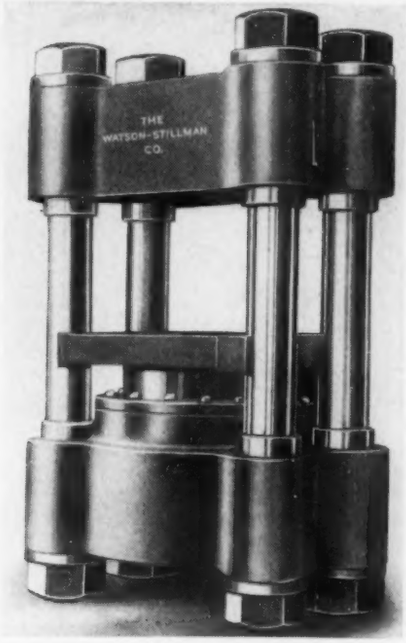


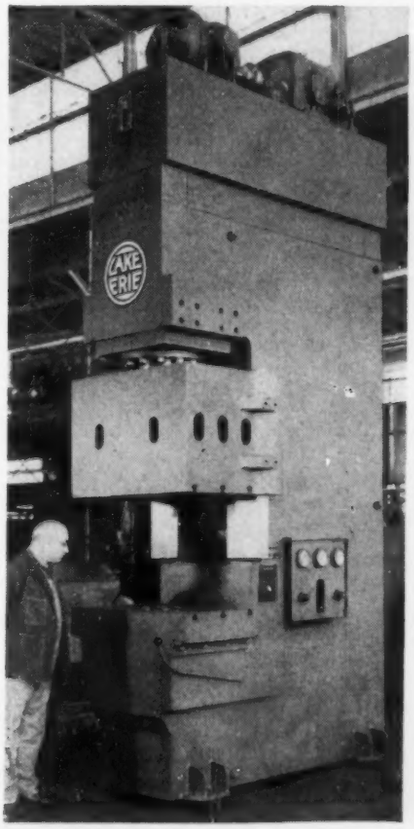
STEAM LABYRINTH — *Lukenweld, Inc., 1943 Gillen St., Coatesville, Pa.* A weld-assembled steam platen for hot-bed press operations can be made in sizes for all presses.



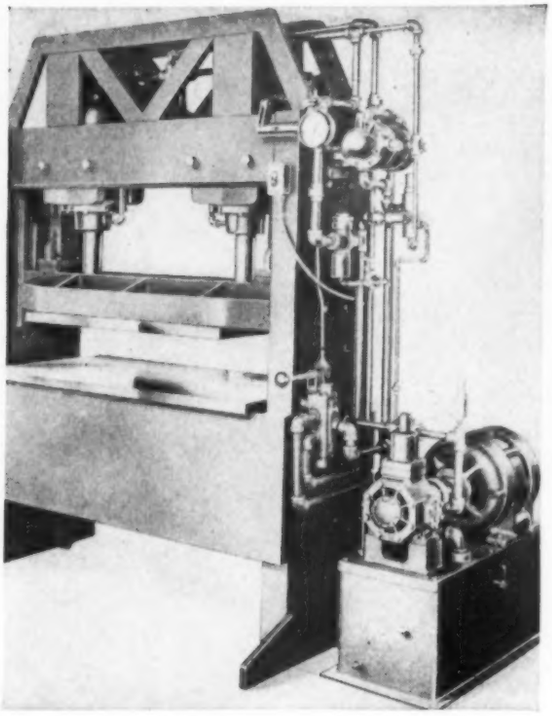
SHOP PRESS—*Rodgers Hydraulic, Inc., St. Louis Park, Minneapolis, Minn.* 60-ton shop press has power supplied by a two-speed hydraulic hand pump. In the high speed it moves the ram 2½ in. per pump stroke, giving up to 2,000 lb. pressure. Maximum opening is 38 in., minimum 8 in. Working width is 45 in.

HOBBING PRESS—*Watson-Stillman Co., Roselle, N. J.* 500-ton hydraulic hobbing press has platens of open-hearth steel castings, with surfaces tooled to a smooth finish. It can be supplied with hand or motor-driven pumps.

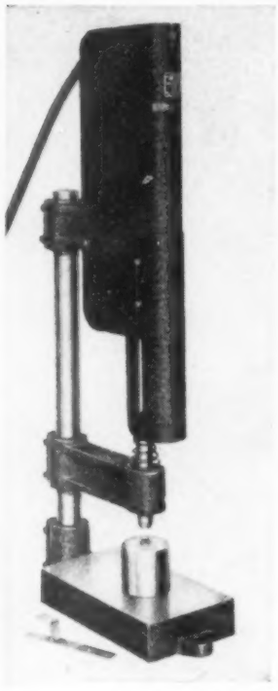




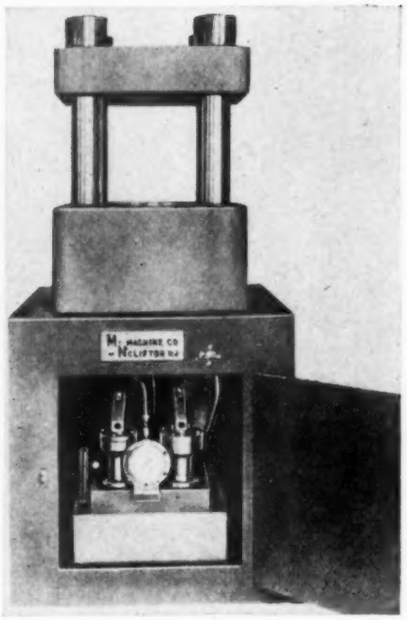
HYDRAULIC PRESS—*Lake Erie Engineering Co., 507 Woodward Ave., Buffalo 17, N. Y.* A 200-ton C-frame hydraulic press with a 42-in. right to left, and 24-in. front to back die space, it has a 30-in. daylight opening and 16-in. stroke of the moving platen. Closing feed of the press is 350 in. per min. and return speed is 345 in.



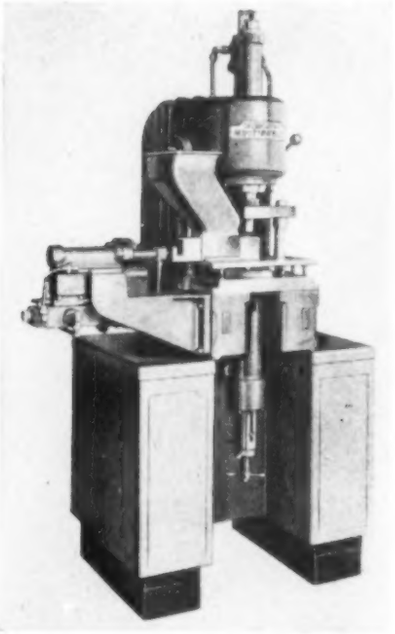
FORMING PRESS—*K. R. Wilson, Buffalo 2, N. Y.* 80-ton blanking and forming press is said to employ much lighter construction without sacrificing operating efficiency. Two heavy-duty hydraulic cylinders develop controlled pressure to perform the work. Frame changes permit adaptation to product or to alterations in production setup.



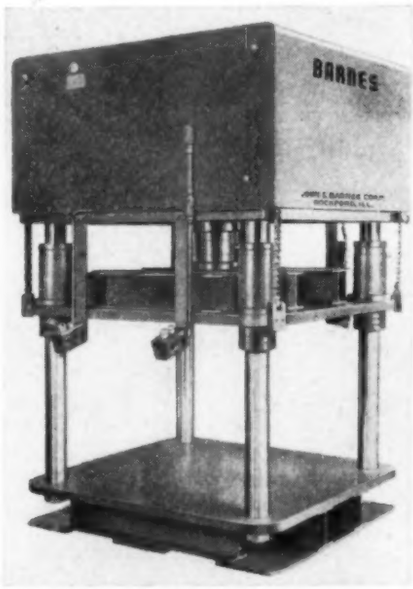
IMPACT AIR HAMMER—*Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Ill.* An impact air hammer weighing 27 lb. that can be used for multiple piercing operations permits punching holes as close together as 1¾ in. on centers. The capacity on 100 psi. is ⅜ in. hole in 0.065 cold-rolled steel. The ram delivers a blow equivalent to approximately 4000-lb. pressure.



HOBBING PRESS—*M. & N. Machine and Tool Works, 146 Orono St., Clifton, N. J.* The Model M13A hydraulic hobbing press is intended for hobbing cavities for rubber and plastic molds, or for jewelry dies. It is a 200-ton capacity hand-pump press.



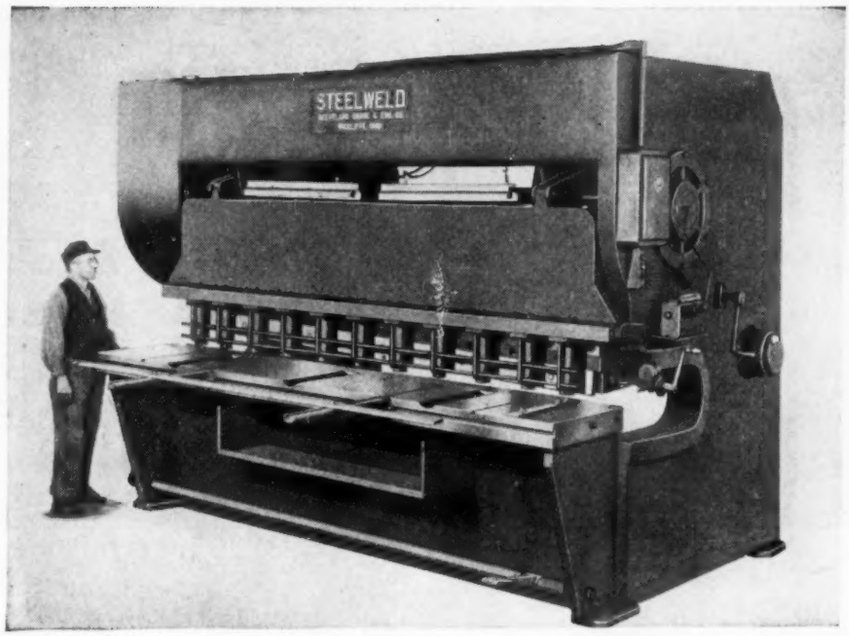
SHUTTLE-FEED ACCESSORY—*The Denison Engineering Co., Columbus 16, Ohio.* A shuttle feed accessory for use on the Multipress can be used for a variety of production jobs, one of which is powder pelleting. The press ram can be adjusted to deliver up to 18 short full-pressure loaded strokes in conjunction with each full stroke. The length of these short strokes can be adjusted from 1/32 to ½ in.



HYDRAULIC PRESSES — *John S. Barnes Corp., 301 S. Water St., Rockford, Ill.* Two hydraulic presses of 25-ton (shown above) and 50-ton capacities are designed for piercing, punching, forming, and drawing of sheet metal parts. Each press is powered by a self-contained hydraulic unit for smooth operation and finger-tip control.

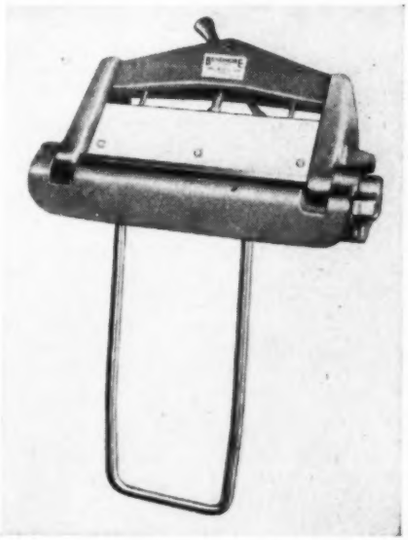
HYDRAULIC PRESS—*Northern Tool & Machine Co., Box 68, Melrose Park, Ill.* A motor-driven portable hydraulic press of 20 tons capacity has an arch frame of fabricated steel-plate designed to divide the load between the two sides of the press.

ELECTRIC-HYDRAULIC PRESS — *Dake Engine Co., Grand Haven, Mich.* An electrically-operated hydraulic press, the "Elec-draulic," is supplied in 50- and 75-ton capacities. Ram speed is variable from 0 to 6 rpm., while the workhead can be moved to any point along the top channels for off-center work.



SHEAR—*Cleveland Crane & Engineering Co., Wickliffe, Ohio.* Steelweld shears employ a pivoted-blade principle. There are no slides or guides to wear and cause inaccuracies. The upper blade operates on two heavy pivot pins secured to the end housing and travels in a circular path. A dial indicates clearance in increments of 0.001 in.

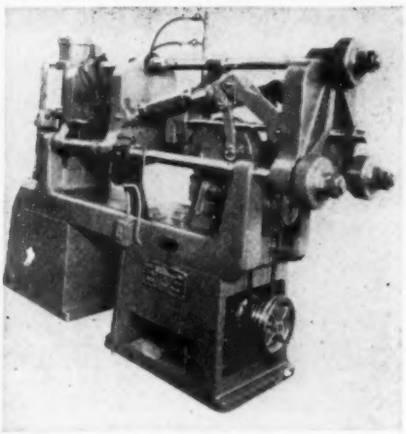
BRAKE—*O'Neil-Irwin Mfg. Co., Lake City, Minn.* A 24-in. brake, Di-Acro No. 4 will handle 16-gage sheet steel. In the new model, special material clamping action makes possible extremely sharp bends. Double-edge vertical folding plate allows close reverse bends to be formed.



HAND BRAKE—*Carl Wirth & Son, 1625 Clinton Ave., No., Rochester 5, N. Y.* The "Bendmore" handles material up to 3/32-in. thick, and 12 in. wide with bends possible to 135°.

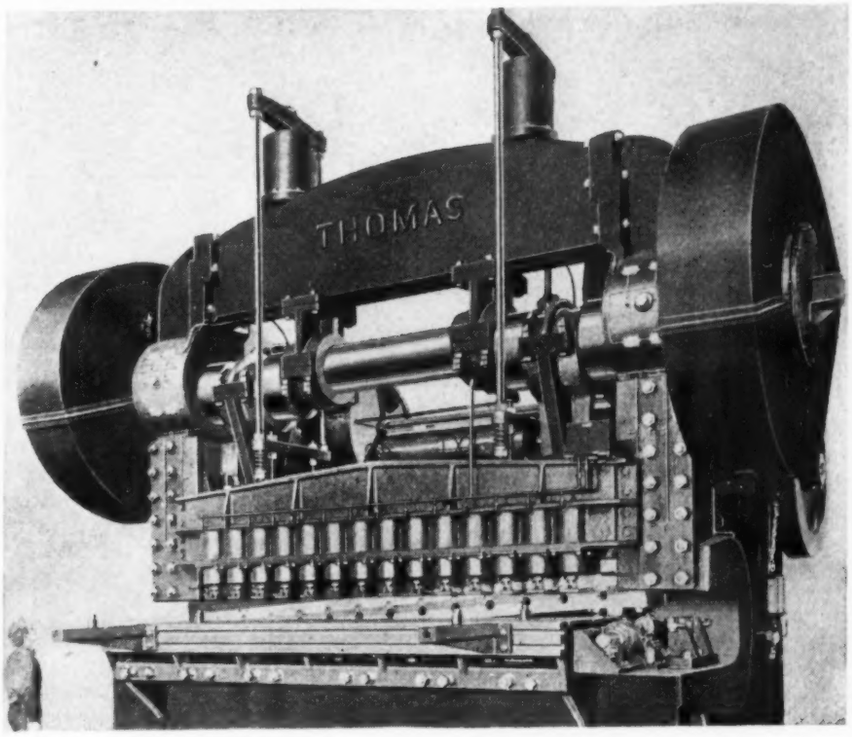
SHEARS—*Thomas Machine Manufacturing Co., Pittsburgh 23, Pa.* One of an improved line of mill-type plate shears with up to 3 in. in thickness and 14 ft. in width, or more. This shear has a twin drive on the main shaft to reduce torsion.

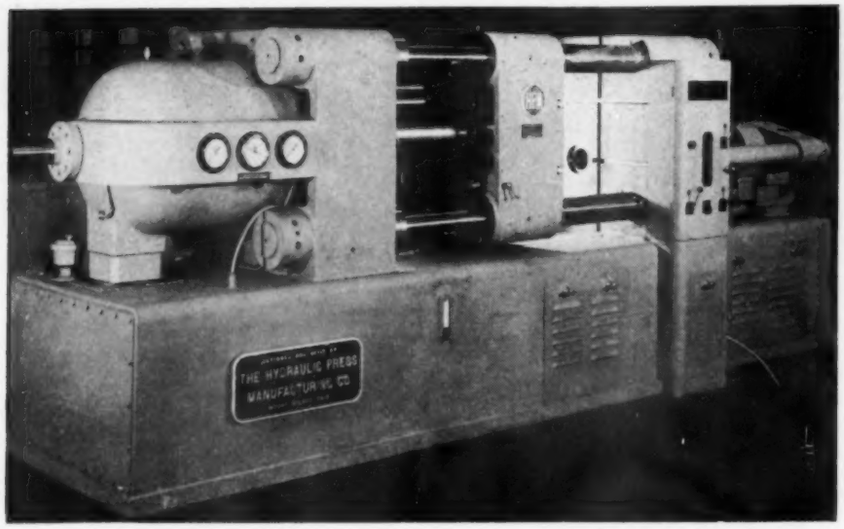
DIE CASTING MACHINE—*DCMT Sales Corp., 401 Broadway, New York 13, N. Y.* Runs as small as 250 parts are economical with a die-casting machine, said to take only two to three minutes to set up. Prefabricated die sets are available for the machine.



DIE CASTER—*Light Metal Machinery Co., Inc., 736 Penton Bldg., Cleveland, Ohio.* Improvements in the automatic die-casting machine for zinc, lead, and tin: delay between cycles is eliminated by a patented cycling mechanism that provides automatic die movement, shot and ejection in continuous cycles. Once the cycling range has been set, production rate is automatic.

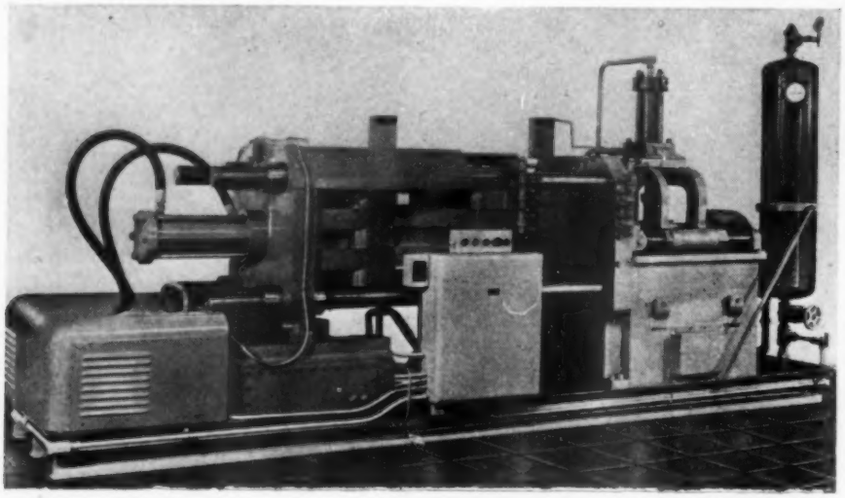
DIE-CASTING MACHINE—*Cleveland Automatic Machine Co., 2261 Ashland Rd., Cleveland 3, Ohio.* Model 400 die-casting machine is available for zinc, tin and lead casting, or for magnesium,, aluminum, bronze or brass. Complete elimination of cold metal from the shot furnace, improved hydraulic performance, automatic timing, and improved adjustable bearings are said to be included.

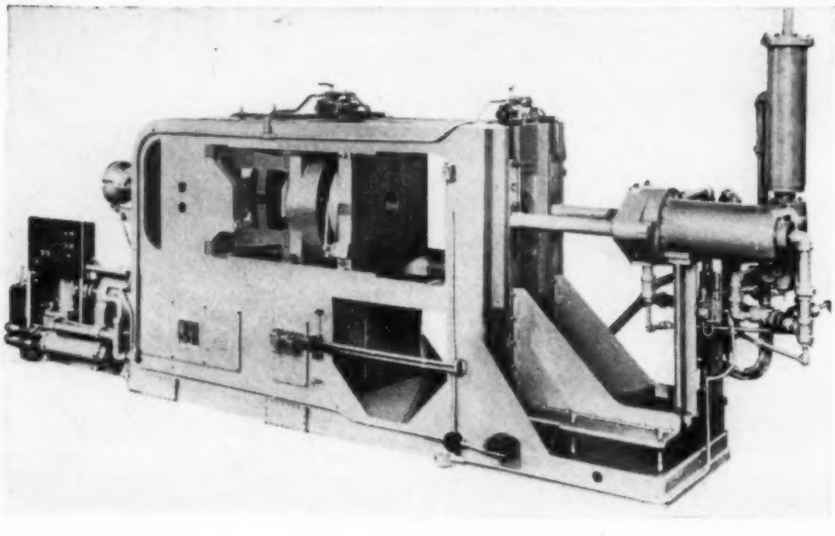


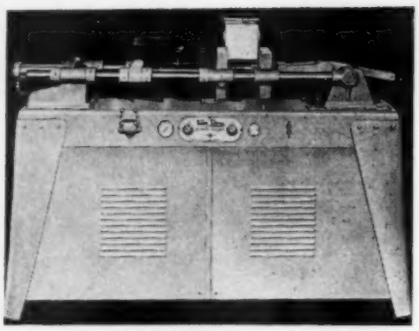


DIE-CASTING MACHINES—*Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio.* High-pressure die-casting machines for casting magnesium, aluminum, and copper alloys have mold clamping, metal injecting, core pulling and ejecting units all operated by direct hydraulic means. The cold-chamber process is employed. The machines have injection capacities from 12½ to 100 cu. ft. per cycle.

DIE CASTER—*Hydraulic Machinery, Inc., 12825 Ford Road, Dearborn, Mich.* A fully hydraulic, self-contained, die-casting machine for zinc, aluminum, and brass alloys, Model M-114, has a simplified arrangement for installation of the plunger without bolts or other loose parts. A new pot and gooseneck can be installed in a half hour. The machine, which weighs approximately 16,000 lb., has a 10-in. die opening. ↓

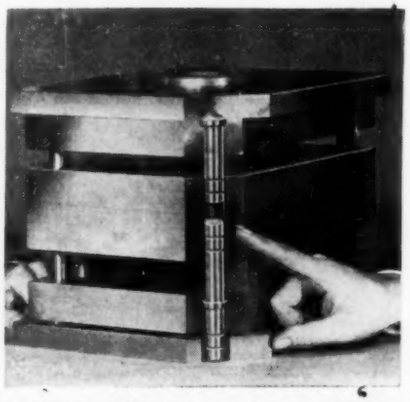






PLASTIC INJECTION PRESS—*Van Dorn Iron Works Co., 2685 E. 79th St., Cleveland 4, Ohio.* A power-operated plastic injection press of 1 oz. capacity, the H-200, has plunger injection and mold closing operated by hydraulic cylinders. Molds may vary in thickness from 3 to 8½ in.

STEAM GENERATOR — *Livingstone & Co., 89 Broad St., Boston, Mass.* An electrically-operated steam generator to supply steam to plastic molding presses and for other uses. With Speedylectric, pressures up to 200 psi. and volume up to 2 boiler hp. are possible.



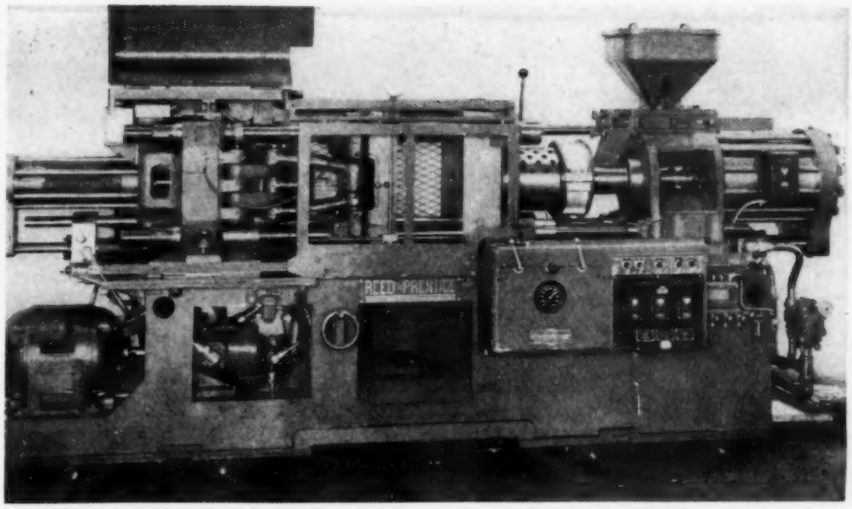
MOLD BASE—*Detroit Mold Engineering Co., 6686 E. McNichols Road, Detroit, Mich.* Mold base to expedite plastic molding has return pin installed directly in line with leader pin. Dowel pins are completely eliminated in the cavity retainer plates. The base is available in nine standard sizes, 9 x 12 in. to 18 x 36 in.

HEATING UNIT—*W. T. La Rose & Associates, Troy, N. Y.* High-frequency heating unit, the Thermall "Champ" will heat 6 lb. of material to molding temperature in one minute. Automatic electric time control has intervals from 0 to 3 min. by seconds.

INJECTION-MOLDING PRESS — *Munton Mfg. Co., Franklin Park, Ill.* A hydraulic press for thermo-plastic injection molding in small runs or for experimental purposes is of vertical construction, occupies only 24x48-in. floor space. It has a mold space 9x9x5 in. and will handle up to 3 oz. of plastic.

←

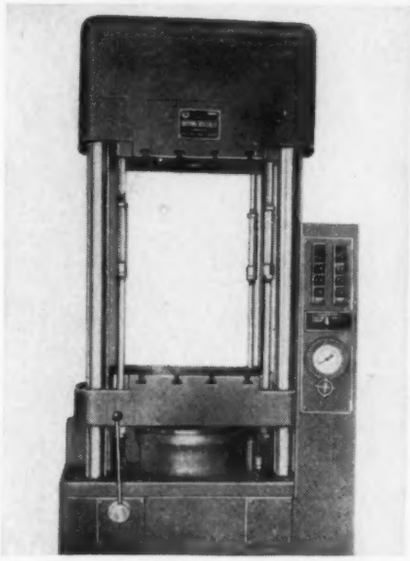
DIE CASTING MACHINES—*Lester-Phoenix, Inc., 2711 Church Ave., Cleveland 13, Ohio.* Model HP-3 ½-SF is for zinc, tin and lead alloys; Model HP-3½-X-SF for aluminum, brass and magnesium. The locking pressure possible within the one-piece steel casting is rated at 600-tons. Zinc castings up to 19 lb. and aluminum castings up to 14 lb. can be made.



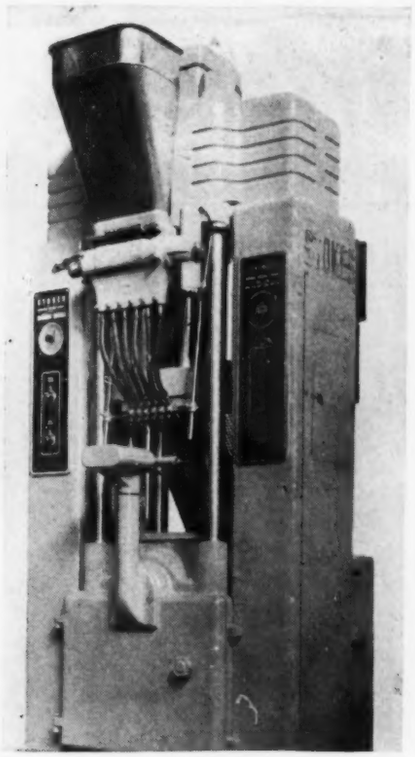
INJECTION MOLDER — *Reed-Prentice Corp., Worcester, Mass.* New features in the 6- and 8-oz. plastic-injection molding machines, model 10D, are double-shear link mechanism to increase rigidity and reduce maintenance. Hydraulic piping and valves are mounted outside the base.

INSERT-REMOVING TOOL — *Keller Tool Co., Grand Haven, Mich.* A fast, powerful insert-removing tool for a variety of plastic-molding operations. Model 1458 delivers four times more stall torque than previous models. A lighter model is available where less power and more speed are required. Both models run in either direction, weigh 2½ lb.

RUBBER MOLDING — *Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* The Turbo-jector for production molding of both natural and synthetic rubber by means of a motor-driven screw, injects rubber into a hydraulically clamped mold. Cycle is automatic. Injection pressures are to 18,000 psi.

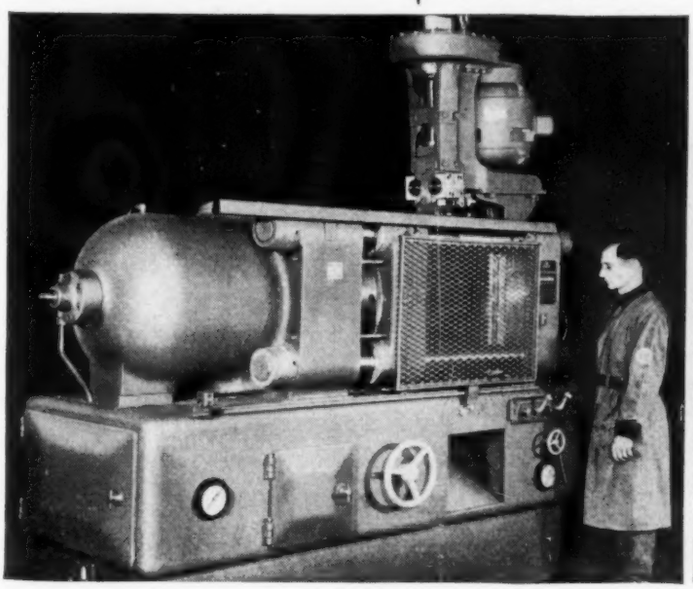


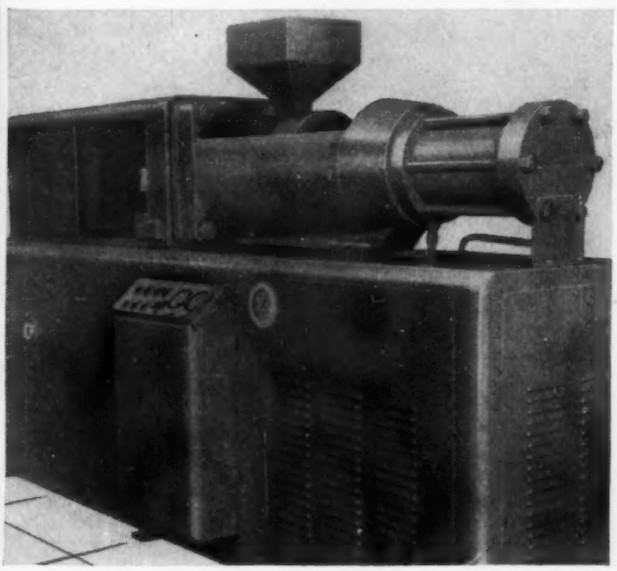
MOLDING PRESS—*Watson-Stillman Co., 75 West St., Roselle, N. J.* Semi-automatic 200-ton capacity compression molding press for high-speed operation, has stroke of 15 in. with an advance speed of 52 ipm., pressing speed 12.5 ipm., return speed 100 ipm.



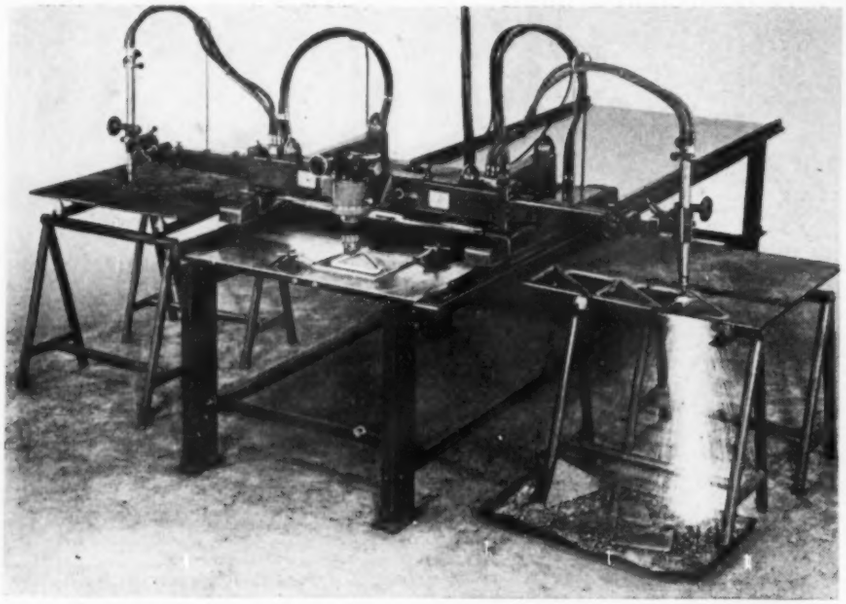
PLASTIC MOLDING PRESS—*F. J. Stokes Machine Co., 5935 Tabor Road, Philadelphia 20, Pa.* A completely automatic hydraulic machine of 50-ton capacity for plastic molding with the automatic cycle controller set by changing the position of buttons on various bars. The press opens and closes at the rate of 100 ipm., final closing speed is adjustable from 8 to 0 ipm. Maximum stroke is 14 in., and capacity in each of the six feed chambers is 4 cu. in.

PLASTIC MOLDER—*Hydraulic Machinery, Inc., 12825 Ford Road, Dearborn, Mich.* A plastics injection molding machine of 2 oz. capacity Hy-Mac Model IM-2 has two electronic controls to regulate heat in the chamber and nozzle with an accuracy of plus or minus 2 F. The machine has a 50% overload capacity and will take up to 6 shots per min.





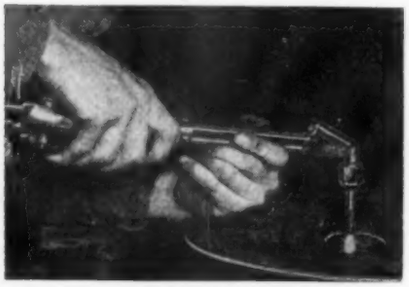
Welding and Heat-Treating



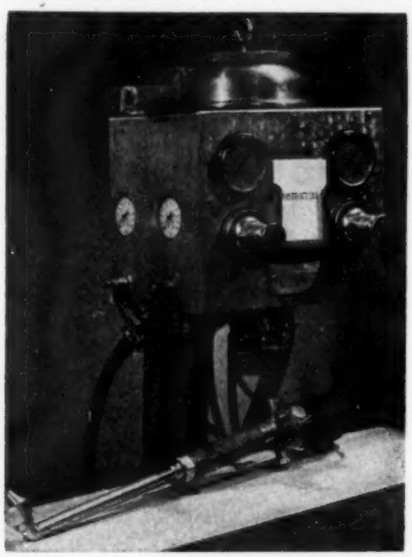
SHAPE CUTTING—*The Linde Air Products Co., unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York, N. Y.* Oxweld CM-15-36 has new attachment to mount blowpipes on both sides of the tracing table, permitting the cutting of identical shapes on both sides of the tracing table. All types of shape-cutting performed with larger machines are possible within the 36-in. transverse working range of this machine. The longitudinal range is 100 in., but can be extended.

GAS GUN—*Century Aircraft Co., 5601 W. Century Blvd., Inglewood, Calif.* A self-lighting, self-extinguishing acetylene torch ignites with pull of trigger and extinguishes on its release. Variations in flame, with temperature range of from 950 to 2000 F., are obtained by adjusting a pressure regulator.

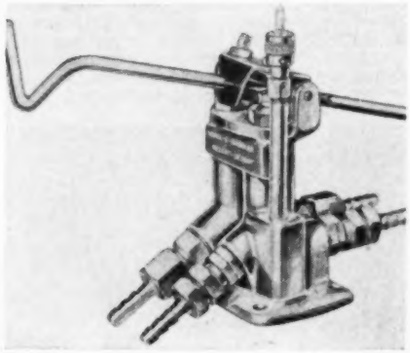
FLAME CUTTING STAINLESS—*Air Reduction, 60 E. 42nd St., New York 17, N. Y.* Oxy-acetylene cutting of stainless steel is possible by the flux-injection method. Flux is introduced into the cutting oxygen streams at a predetermined rate which removes the oxides at a temperature comparable to those encountered in the burning of mild steel.



CUT TORCH—*Wall Chemicals Div. of Liquid Carbonic Corp., 3100 South Kedzie Ave., Chicago 23, Ill.* The Gasweld Featherweight cutting torch is designed for light metal cutting and occasional heavier cutting. Weighing 2 lb. 2 oz. the torch is 16 in. from tip to butt of handle.

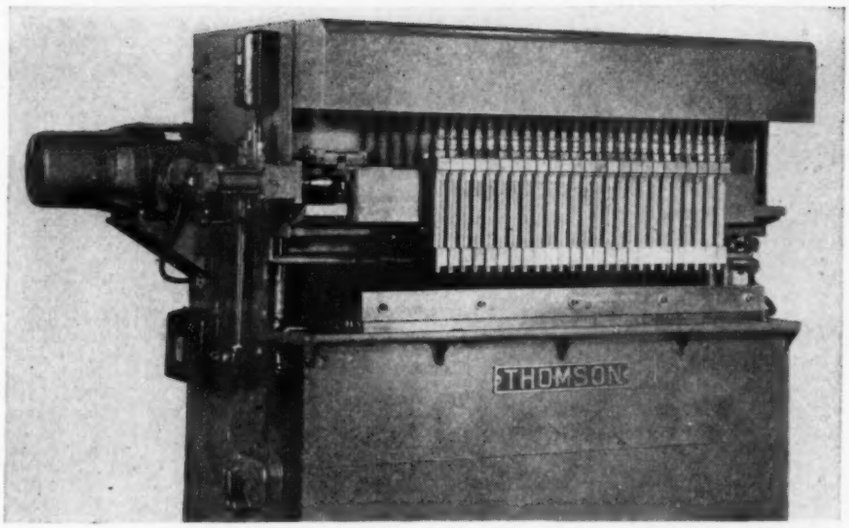


POWDERED METAL WELDING—*Powder Weld Co., 419 Kent Ave., Brooklyn, N. Y.* Method of welding, brazing, or surfacing with infinite compositions of powdered materials using a torch with a special nozzle and 16 controls, a control box with air- and gas-pressure regulating valve; and a canister from which powdered materials are fed through the flame. Compositions of powders or finely divided metals together with suitable fluxes are projected through the flame onto the work surface.

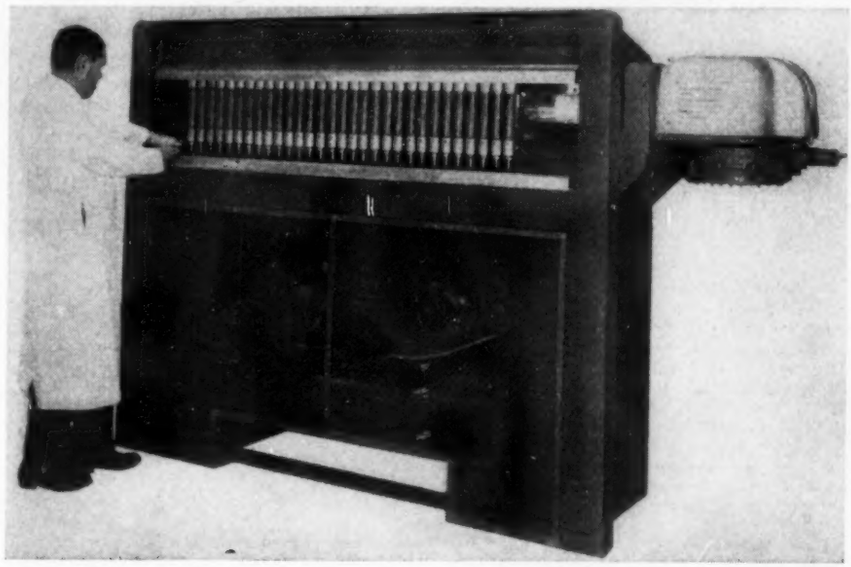


VALVE—*Weldit Inc., 652 Bagley Ave., Detroit 26, Mich.* Model E Gasaver cuts oxygen and acetylene consumption and has a non-smoking pilot light. Lever rod, on which torch is hung between welds to shut off both gas and oxygen intake lines, is adjustable in length.

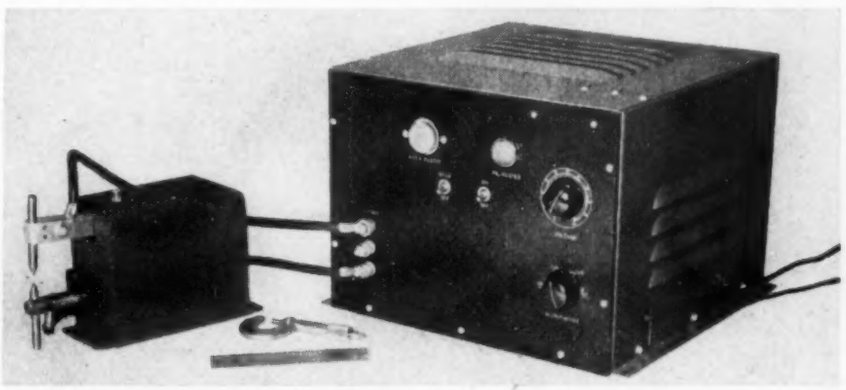
FLAME-CUTTING MACHINE—*Ohmstede Machine Wks., Beaumont, Tex.* Designed to cut an unlimited variety of shapes, the machine can be used either as a portable or stationary type. The cutting range is 65 in. lengthwise and 30 in. laterally. Cutting speed is varied by adjusting rheostats on control panel.



SPOT WELDER—*Thomson Electric Welder Co., Lynn, Mass.* Designed for welding wire mesh for grills, racks and trays, and similar items, an "Ultra Speed" spot welder has capacity from 14 to 14 gage minimum, to 0 to 0 gage maximum. To handle welds in a diamond mesh or diagonal weave, a shuttle bar moves the entire bank of electrodes right or left.



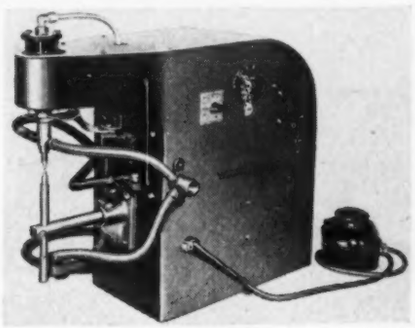
SPOT WELDER—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* "Progressive-O-Matic" resistance welding machines have a high speed of operation and the various welding guns can weld different thicknesses. An air-driven unit controls the sequencing of the entire machine.



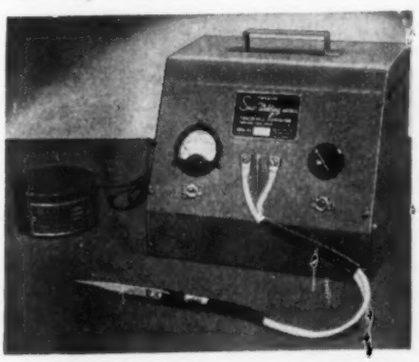
WELDER—*Raytheon Manufacturing Co., Foundry Ave., Waltham, Mass.* Condenser-type welding unit provides a 3-amp. peak with 110-v. 60-cycle current. Suitable for welding metals of high thermal conductivity such as aluminum, copper and phosphor bronze. Allowable speed ranges from 120 welds per min. at low voltage and capacity setting, to 60 welds per min.

PRESS-TYPE WELDER — *Federal Machine and Welder Company, Warren, Ohio.* An automatic, hydraulically operated press-type welder in 30, 50 and 75 kva. capacities is suitable for either spot or projection welding. The machine applies welding pressure through an inverted-type hydraulic cylinder.

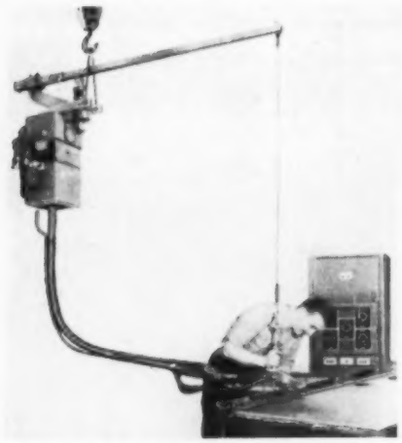
BENCH SPOT WELDER—*Thomson Electric Welder Co., Lynn, Mass.* Model A-11 bench-type spot welder suitable for rapid resistance welding of small parts is driven by a ¼-hp. motor. Transformer capacities of 10 and 15 kva. are available. Heat regulation is provided by a 5-point regulator. The lower arm can be raised or lowered or shifted laterally as the nature of the work requires.



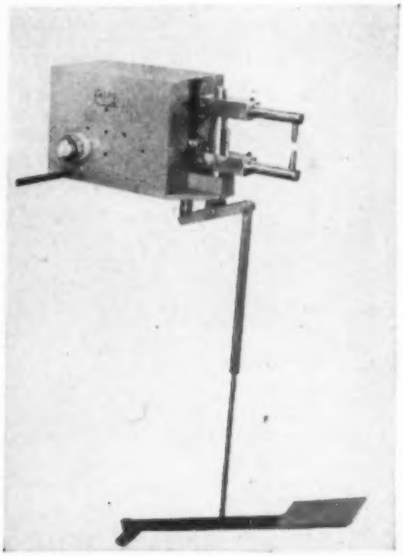
SPOT WELDER—*Weldex Inc., 7324 McDonald Ave., Detroit 10, Mich.* An improved bench-type spot welder Model 263-A is a 3-kva., 220-v. 60-cycle, single-phase precision welder for lightweight metal. It is foot controlled and electronically timed with an adjustable pressure switch.



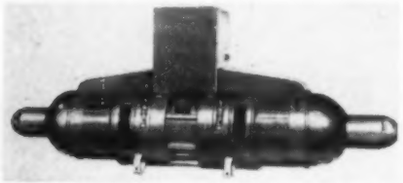
SPOT WELDING — *Tweezer-Weld Corp., 280 Plane St., Newark 2, N. J.* A portable unit with a pair of insulated forged copper tweezers and a foot switch. Application is for fabricating metal parts measuring 0.0005 to ⅛ in. round or thick.



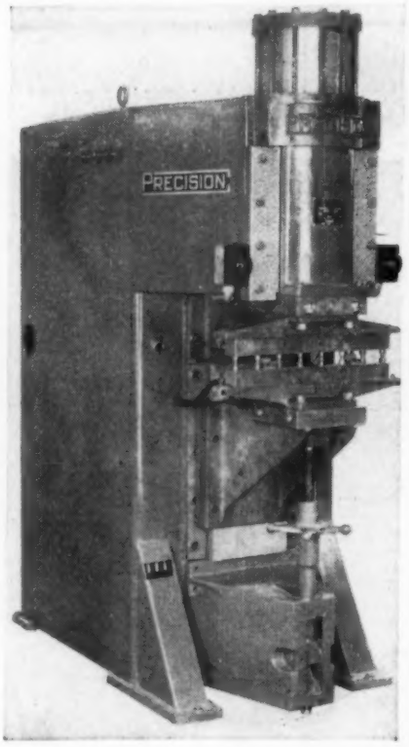
SPOT-WELDERS—*Sciaky Bros., 4915 W. 67th St., Chicago, Ill.* Overhead-type portable units with both pneumatic and hydraulic systems, available with transformer rating of 50, 75, and 100 kva. Includes several lightweight guns in alligator and C types. Spring-type or pneumatic balancers are provided for positioning the gun.



SPOT WELDER—*Acro Welder Mfg Co., Inc., 1831 W. St. Paul Ave., Milwaukee, Wis.* Spot-welder of 3-kva capacity operates on a 110-volt, 60-cycle, single-phase current. High, medium, and low positions are provided. The machine with pedal and cord weighs 103 lb.



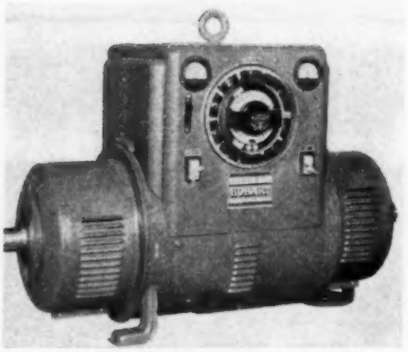
PARALLEL WELDER—*The Lincoln Electric Co., Cleveland, Ohio.* A 1200-amp. welder comprising two 600 amp. generators, close-coupled to an ac. induction motor and equipped with complete motor control for the Lincolnweld automatic metallic shielded arc-welding process. Output leads of the generator are paralleled in the control box by means of copper jumpers between studs of like polarity. Designated SA-1200, this welder weighs 3,200 lb.



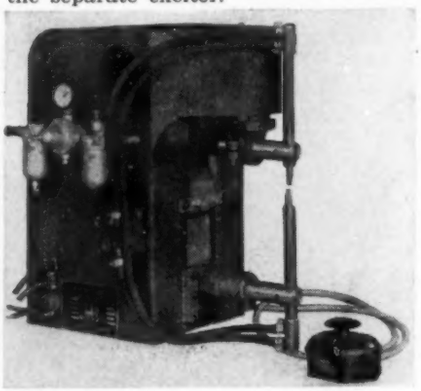
SPOT WELDERS—*Precision Welder and Machine Co., 138 E. McMiken St., Cincinnati 10, Ohio.* Series of air vertical action spot and projection welders, Type AVA, is made in four sizes from 30 kva. to 500 kva., with pressure to a maximum of 18,000 lb. The machines are constructed with unit assemblies and so the interior is accessible.

AUTOMATIC WELDING HEAD—*The Lincoln Electric Co., Cleveland 1, Ohio.* Improved head is designated LAF-2. To expand the use on sheet metal work, the head will accommodate a 3/32-in. electrode. To start the arc a single control switch is turned to the "Down Weld" position.

ALUMINUM FLASH WELDER—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* Storage-battery powered welders for flash welding aluminum consists of the flash welder, the battery power pack, and the battery charger and control. The power pack will supply up to 38,000 amp.

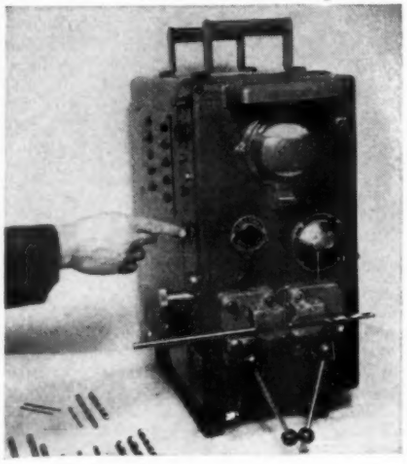


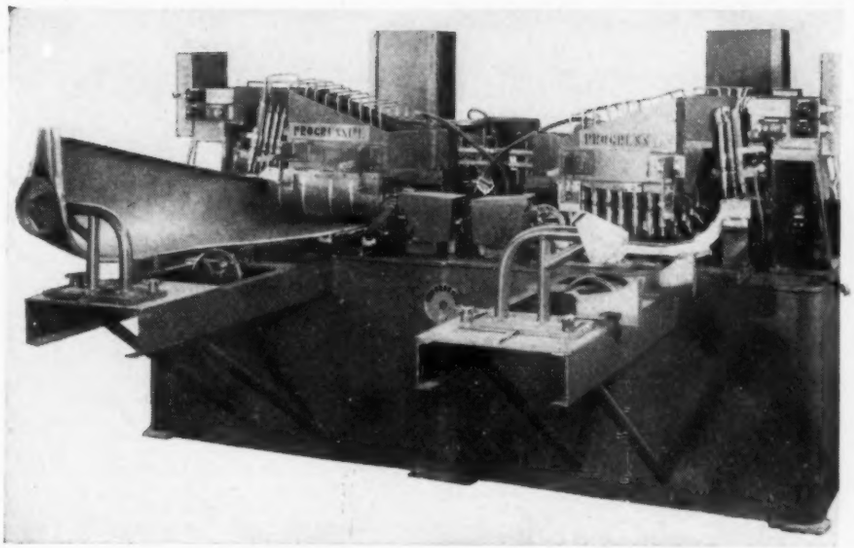
SYNCHRONOUS MOTOR WELDER—*Hobart Bros. Co., Troy, Ohio.* Compact, synchronous motor welder, which utilizes an in-built separate exciter is so proportioned that it can be started across the line and automatically synchronizes itself by the build-up of the separate exciter.



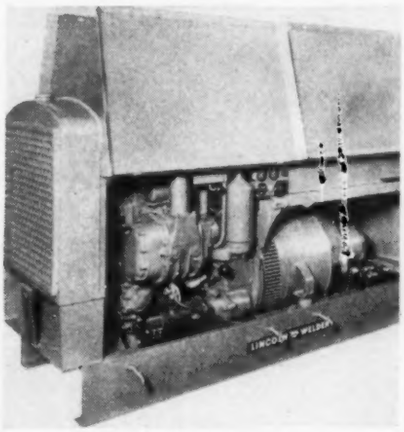
SPOTWELDER—*David & Murphy, 5252 Broadway, Chicago 40, Ill.* Added to the 1-kva. and 3-kva. air-operated midget spotwelders, Universal USP-7½ is a plug-in type and includes solenoid-valve control of air cylinder. Equipped with air filter, pressure gage and automatic lubricator.

PORTABLE WELDING UNIT—*The DoAll Co., 1301 Washington Ave., S., Minneapolis 4, Minn.* Portable welder designed for production welding of bar and round stock up to 5/16-in. dia., Model DBW-3A, has a built-in grinder for weld dressing, automatic motor-controlled feed of material, and cam-operated lever method of clamping which speeds up welding. Bandsaw blades from 1/16- to ¼-in. wide can be welded.

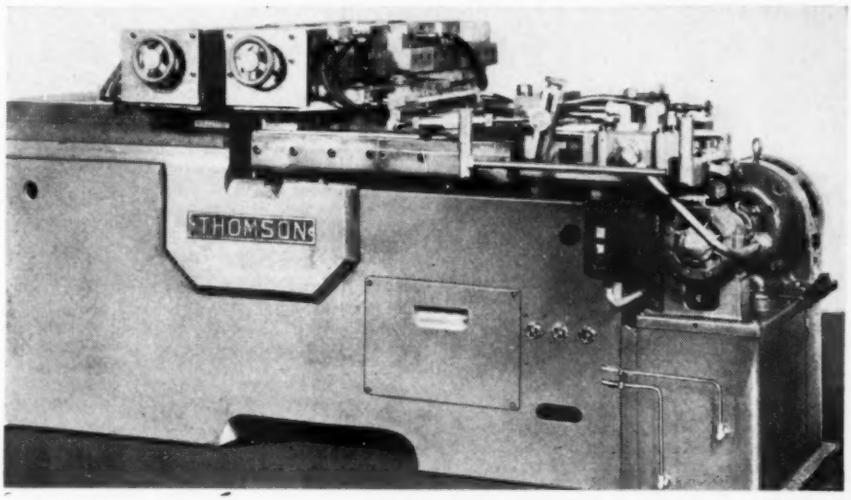




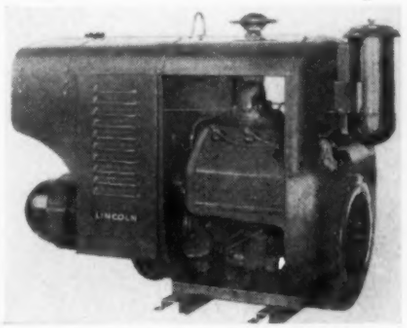
WELDER—*Progressive Welder, 3050 E. Outer Drive, Detroit 12, Mich.* Welding operations on both right- and left-hand fenders are performed on duplex ultra-speed welding machine, at a rate of 150 units per hour. The two positions can be operated individually or simultaneously. Three types of welding guns are incorporated in the machine.



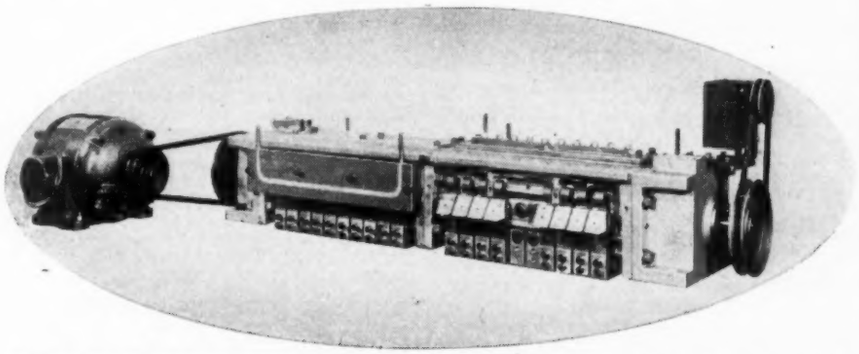
WELD GENERATOR—*Lincoln Electric Co., Cleveland 1, Ohio.* The welding generator has an NEMA rating of 300 amp. at 40 volts. Current range for welding duty is from 20 to 40 volts, 60 to 375 amp. The generator is a single-operator variable-voltage type, with complete laminated magnetic circuit and equipped with interpoles. It requires no external reactance or stabilizer.



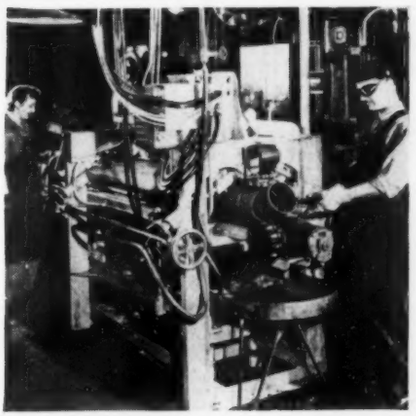
FLUE WELDER — *Thomson-Gibb Electric Welding Co., Lynn, Mass.* Locomotive boiler flues and superheater tubes are salvaged by welding "Safe Ends" to used tubes on the Model F4 flue welder. Powered with a 150-kva. transformer it will handle anything from 1¼-in. dia. tubes up to 6-in. dia. superheater flues. Rate of production on small pipe runs from 40 to 150 per hr. Clamping mechanism is shielded.



WELD GENERATOR—*Lincoln Electric Co., Cleveland, Ohio.* The Shield-Arc, Jr. measures 24 x 48 x 30 in. and has a current range of 40 to 250 amp. The welder is powered by a Wisconsin air-cooled 4-cylinder V-type engine.

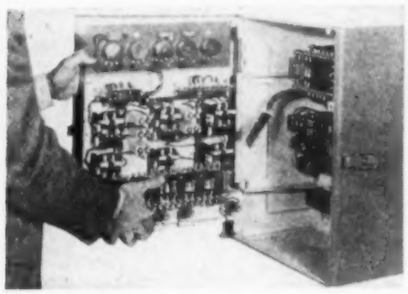


WELDER CONTROL UNIT—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* Permits automatic assembly welding rates up to 900 spots per minute. The unit is included in all Progressive Ultra-Speed welding machines. It distributes welding current to single or to groups of welding points successively by means of a screw-driven carriage that depresses push rods to engage contacts. All points bear on the work simultaneously.



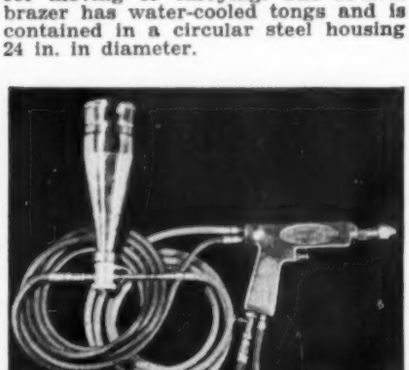
SEAMWELDER—*Victory Engineering and Machine Works, Inc., 3000 Chateau, St. Louis 3, Mo.* A fixture for continuous seamwelding with a variable speed range of from 60 to 150 ipm. The welding head remains stationary while the work moves under it in a continuous stream. In addition to round tubes, the fixture can be furnished to handle square or odd-shaped tubes. Model 0412 handles diameters from 4 to 12 in., Model 1224 from 12 to 24 in., and Model 2436 from 24 to 36 in.

WELDING CONTROL UNIT—*Square D Co., 4041 N. Richards St., Milwaukee, Wis.* Automatic control of air-operated resistance welding machines is provided in the Class 8992 combination control unit. A Syncro-Break welder contactor and Safront sequence-weld timer are included in a single inclosure.

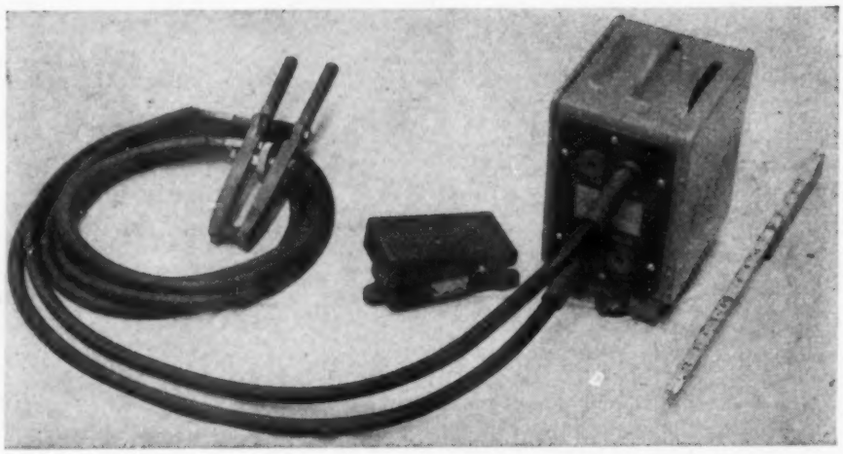


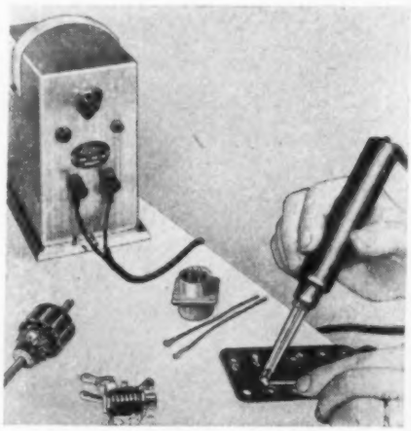
WELD TIMERS—*Control Div. of General Electric Co., Schenectady, N. Y.* Line of sequence and sequence-weld timers has been completely redesigned. Includes an improved electronic timing circuit to permit consistent welding speed with short timing intervals. Electrical connections between front and rear panels are made by plug connectors so front can be removed.

PORTABLE BRAZERS — *Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.* The 10 kva. unit has air-cooled tongs and weighs 100 lb. It is provided with casters and handles for moving or carrying. The 20-kva. brazer has water-cooled tongs and is contained in a circular steel housing 24 in. in diameter.



SPRAYWELDER — *Wall Colmonoy Corporation, 720 Fisher Bld., Detroit 2, Mich.* A unit for use with powdered Colmonoy hard-facing alloys, the Spraywelder consists of a gun, air hose, oxygen and acetylene hoses with connections to fit standard regulators, and carburetor and hoses. The hard-facing alloy is applied to the desired thickness. It is then fused to the base metal with (1) oxy-acetylene equipment, (2) induction equipment, or (3) controlled atmosphere furnace.





SOLDERING TOOLS—*Luma Electric Equipment Co., Toledo, Ohio.* Two power unit models and choice of 8 basic single or double carbon electrodes permit the Luma Resistance Type Soldering Tool to handle anything from precision work to heavy industrial operations.

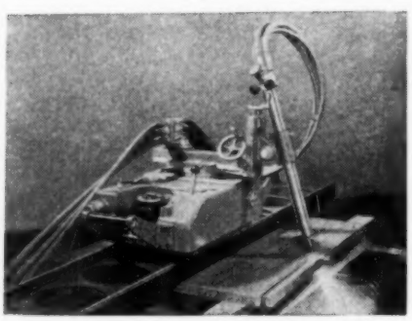
STAINLESS ELECTRODES—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Arc welding on stainless steel with alternating and direct current, is said to be performed at lower base metal temperatures with the new "Low Temp" welding electrodes. These flux-coated metal-arc electrodes are produced in sizes from 3/64 to 3/16 in. in dia.

SILVER BRAZING ALLOYS—*Handy and Harman, 82 Fulton St., New York 7, N. Y.* Easy-Flo 45 contains 45% silver with copper, zinc, and cadmium. The melting range is 1120 to 1145 F. Easy-Flo 35 is 35% silver with a melting range of 1115 to 1295 F.

STAINLESS-STEEL ELECTRODES —*The Lincoln Electric Co., Cleveland, Ohio.* Stainweld A 7, discontinued during the war, is available in improved form for AISI 304 and 308 stainless steels. Stainweld A 7-Cb is columbium stabilized for use with stabilized 18-8 steels designated AISI 321 and 347.

ELECTRODE — *Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis.* A coated beryllium-copper electrode, known as Beryl-Trode, has a medium weight, flux coating required for stabilizing the arc, flux oxides formed in the welding operation, and produces a dense deposit. The electrode is designed to weld parts made of beryllium-copper.

BRAZING SETS—*Westinghouse Electric Corp., Pittsburgh 30, Pa.* Self-contained portable brazing sets that require connection to a 220-volt power source, consist of a transformer for providing high current at low voltage, voltage selectors, controls and carbon-tipped tongs. Three sizes have capacities of 5, 10, and 20 kva.



WELDING CARRIAGE—*Linde Air Products Co., 30 E. 42 St., New York 17, N. Y.* It can be used for carrying Unionmelt electric-welding equipment, the CMA-21-B attachment for plate-edge preparation, single- or multiple blowpipe setups for straight-line cutting, flame-hardening equipment, and the Oxweld C-45 blowpipe.

SPATTER-RESISTANT COMPOUNDS — *General Electric Co., Schenectady 5, N. Y.* Weld-spatter-resistant compounds Nos. 9951 and 9952 are intended for use where weld spatter must be avoided. The surface of the work, even though slightly oily, does not require wetting.

ELECTRODE — *Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis.* An electrode for operating ease in out-of-position welds, AP, has a spray-type arc with deep penetration qualities. It is said to give unusually low spatter loss and has exceptionally thin slag.

FLUX-FILLED SOLDER — *National Lead Co., 111 Broadway, New York, N. Y.* Fluxed wire solder contains the flux in four closed helical grooves. This assures that the flux will melt and deposit on the work before the solder melts. Available in regular wire solder gages and special shapes.

BRAZING ALLOYS—*Handy & Harman, 82 Fulton St., New York, N. Y.* Easy-Flo-45 contains 45% silver and has a flowpoint of 1145 F. This is said to be the lowest working temperature of any alloy capable of making high-strength joints. Easy-Flo-35 has a silver content of 35% and a flow point of 1295 F.

WORK POSITIONER—*Garfield Engineering Corp., Kansas City, Mo.* A universal work positioner, the Powrarm is said to hold light or heavy work, and can be turned 360° horizontally and 180° vertically. Position of work is changed by adjustment of a single-pressure control knob.

ELECTRODE FOR CAST-IRON—*International Nickel Co., 67 Wall St., New York 5, N. Y.* An electrode for cast-iron welding, Ni-Rod, gives a welding process that is said to be both strong and machinable. The arc is reported to be stable in all positions, without flutter.

ALUMINUM-BRAZING FLUX — *A. K. Mauk, 7501 Hamilton Ave., Pittsburgh 8, Pa.* "Flo-Well" No. 2, is said to be equally useful for furnace brazing or torch brazing of aluminum. The flux may be employed alone in brazing 61S and in combination with hydrogen and oxygen may be used in brazing 2S, 3S, 24S and 52S alloys.

ELECTRODE—*The Lincoln Electric Co., Cleveland 1, Ohio.* Shield-Arc LH-70, has a low-hydrogen, low-moisture coating and is for use with dc. polarity. It simplifies the welding of high-sulphur, free-machining steel and certain high tensile, low-alloy steels.

ELECTRODES—*Lincoln Electric Co., Cleveland 1, Ohio.* High-carbon electrodes can be used with most ac. and dc. transformers for building up worn steel parts by welding. Electrodes are designated Hardweld 50 ac., and 100 ac. to distinguish them from the regular Hardweld 50 and 100 which operate only on dc.

CAPACITORS—*General Electric Co., Schenectady 5, N. Y.* For light-metal welders, a line of small dc. Pyranol capacitors is available in a wide range of ratings, with ambient temperature operating limits from 0 to 50 C.

BRAZING FLUX—*Air Reduction, 60 E. 42nd St., New York 17, N. Y.* Elite Aluminum Brazing Flux for brazing 2S, 3S, 53S and 61S aluminum is used with Airco No. 26 wire.

CABLE SPLICE—*Tweco Products Co., Wichita 1, Kansas.* Permanent splicing of welding cables is provided with a series of splicers. The ends are clamped on each end of the splicer which has provision to solder between the cable ends. A fiber sleeve covers the splice.

SEAM-WELDING WHEELS—*Ampco Metal, Inc., 1745 38th St., Milwaukee 4, Wis.* Wheels for all types of roller seam-welding machines have high electrical-conductivity characteristics. Blanks are cast by static or centrifugal casting methods and supplied fully machined or as rough forgings.

WELDING FITTINGS—*Tube Turns (Inc.), Louisville, Ky.* Line of stainless-steel welding fittings includes 180° long radius returns, 90° long radius elbows, 45° long radius elbows, straight tees, reducing outlet tees, caps, eccentric reducers, concentric reducers, lap joint stub ends, laterals and crosses, all in standard and extra heavy weights. A variety of flanges are also included.

ELECTRODE—*Manufactured by Stoody Co., Marketed by Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* An extrusion-coated self-hardening electrode is said to be much stronger, have less tendency to pick up moisture, present a better appearance, and to be completely uniform. It can be used with either ac. or dc. machines.

SILVER WELDING ALLOY—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* A silver welding alloy for high-strength welds on ferrous and non-ferrous metals. EutecRod 1801 is applied by torch, furnace, or induction heating equipment. It bonds at base metal temperature 940 to 1120 F. and melts at 1443 F.

ELECTRODE—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* A general purpose, mild-steel electrode which produces a weld metal of high mechanical property, Airco No. 87, is said to be especially suited for single- or multiple-pass welding on plates or sections where the fit-up is poor, or the work is rusty or dirty.

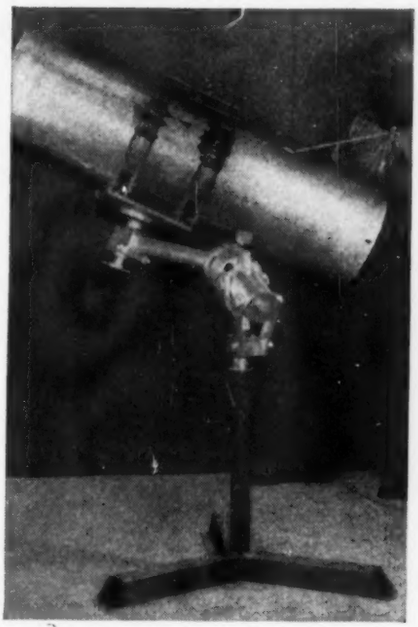
ARC-MAINTAINING COMPOUND—*General Electric Co., Schenectady 5, N. Y.* Strike-easy is an arc-welding compound designed to aid in creating and maintaining a metallic welding arc where low currents and small-diameter electrodes are employed.

BRAZING FLUX—*Sherman & Co., 197 Canal St., New York 13, N. Y.* Nu-Braze Wonderflux No. 4 melts below 480 F. and forms a protective coating before the oxidation temperature of most metals is reached. At 800 F., the flux is water-thin and will flow readily through clearances as small as 0.001 in.

WELDING ROD—*American Brass Co., Waterbury 88, Conn.* Rod intended for oxyacetylene welding of deoxidized copper. Weld produced with Anaconda No. 372 is almost pure copper. Full strength of the annealed plate is developed without cold working.

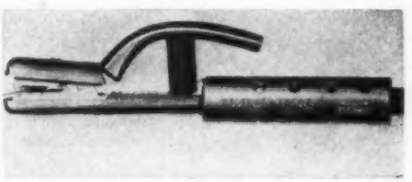
HEADREST SPECTACLE — *Jackson Products, 3265 White St., Detroit 7, Mich.* For low temperature brazing or other applications where complete eye covering is not necessary, the LTB-50 Headrest Spectacle has weight distributed over the entire head. The spectacles can be raised to inspect the work or check equipment.

ELECTRODES—*The Lincoln Electric Co., Cleveland, Ohio.* Abrasoweld AC is designed for building up straight carbon steel, low-alloy steel, or high-manganese steel, with a self-hardening deposit to resist severe abrasion, battering and impact. Manganweld A has been improved for reclaiming worn austenitic manganese steel parts containing 11 to 14% manganese.

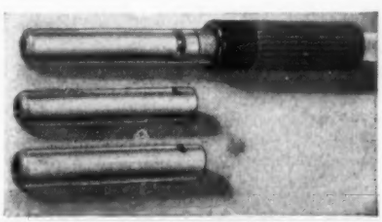


UNIVERSAL POSITIONER—*Lee J. Drennan, Inc., 430 Main St., Arcade, N. Y.* Universal Balanced Positioner aligns the center of gravity of the work mounted on the balance arm with the centerline of the balance head through which the arm rotates. Work when secured in this manner can be moved by finger-light pressure to any degree of angularity.

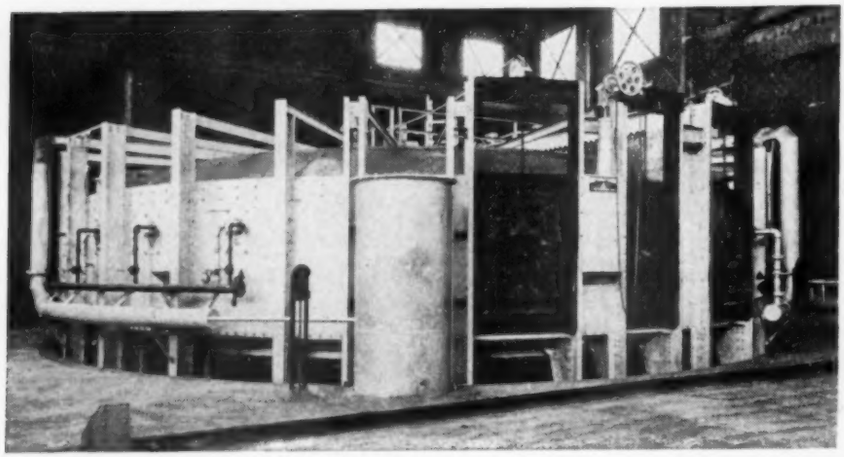
WELDING BOOTH—*Hobart Bros. Co., Troy, Ohio.* Better working conditions for production welders are the purpose of this welding booth. Constructed of fabricated panels, it can be disassembled to move to a new location. Fresh air is drawn in at the top of the booth and expelled on the outside of the building.



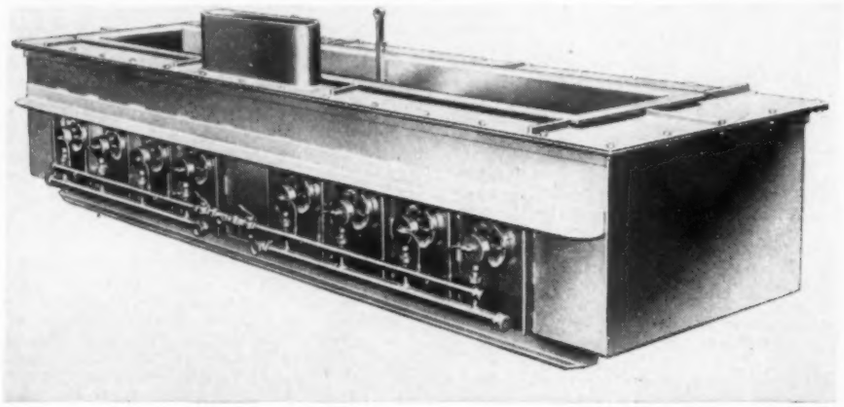
ELECTRODE HOLDERS — *Tweco Products Co., Wichita 1, Kansas.* Manual arc-welding electrode holder known as "Twecotong" is a conventional tong-type holder with a molded-laminated glass cloth Bakelite insulation keyed to the holder casting. The tensioning spring is protected from spatter.



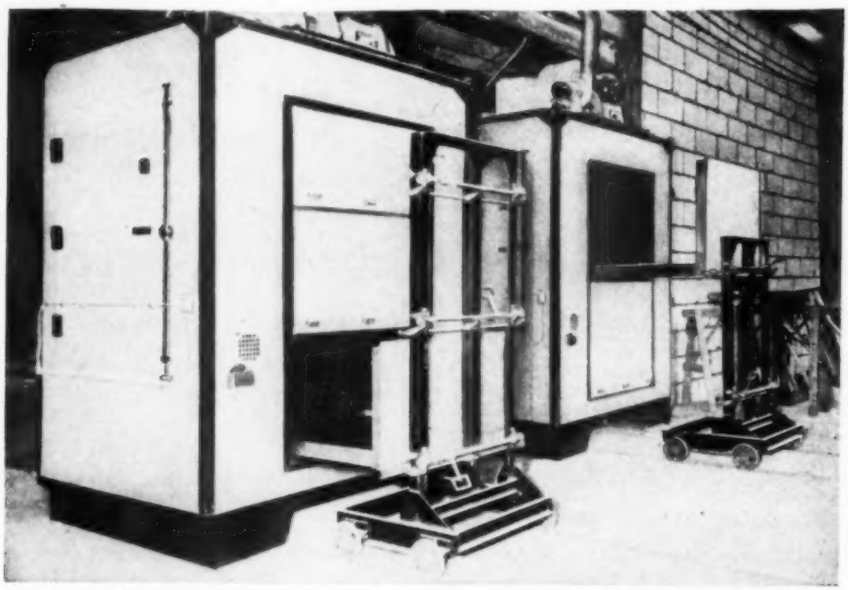
BRAZING ATTACHMENT — *Acet-A-Tip. Co., 5069 W. Madison St., Chicago 44, Ill.* Attachment adapts standard oxyacetylene welding torches for soldering, tinning and light brazing. The Acet-A-Tips are attached to the welding torch tip with a 2-in. length of Acetylene pressure is set at about 5 lb. Oxygen is not used.



FURNACE—*Rust Furnace Co., Pittsburgh, Pa.* A doughnut-shaped rotary furnace in which the counterflow principle of heating is used. In the improved design, a stack has been added with waste gas outlets located near the charging door. Waste gases circulate over the moving hearth entirely around the circumference to the outlet.

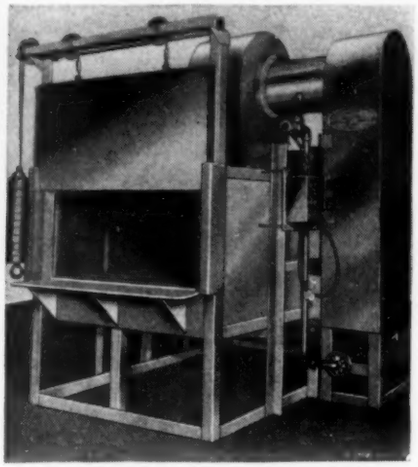


POT FURNACES—*Don C. Campion Laboratories, 9086 Alpine Ave., Detroit 4, Mich.* Low-temperature fire tube bath pot furnace holds a narrow temperature control band. The furnaces are heated by burning the gas-air mixture in a fire tube submerged in the bath. This gives extreme sensitivity to temperature control.

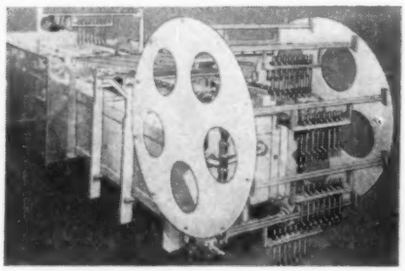


PULL-DRAWER OVENS — *Gehnrich Oven Division, W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn.* A new type of pull-drawer oven, for processing batches of work by drawer, features elimination of structural steel overhead track and oven reinforcement. Drawers are supported on a puller mechanism set on a channel-iron base frame which rides on ball-bearing wheels in a track guide on the plant floor.

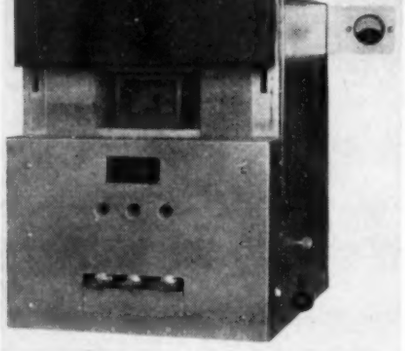
HARDENING FURNACES — *The Sentry Co., Foxboro, Mass.* A larger size Model Y high-speed steel-hardening furnace. Size 5 has a muffle chamber 7 in. high x ⅞ in. wide x 20 in. deep. The furnace is rated at 42 kw.



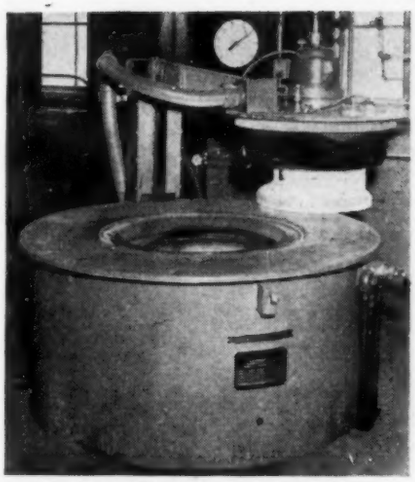
ALUMINUM HEAT-TREATING—*Bellevue Industrial Furnace Co., 2917 Bellevue, Detroit, Mich.* Batch-type furnace for heat-treating aluminum alloys has an atmospheric-type burner mounted on the lower end of the duct used for recirculating the air.



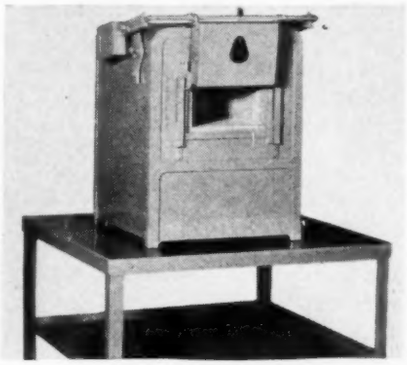
FERRIS-WHEEL FURNACE—*Bellevue Industrial Furnace Co., 2971 Bellevue, Detroit 7, Mich.* A continuous salt-bath furnace with automatic quenching mechanism for cyanide hardening the end of control levers. The ferris-wheel type automatic loader is synchronized to allow the fixture holding the parts to be placed in the slots provided on the continuous chain.



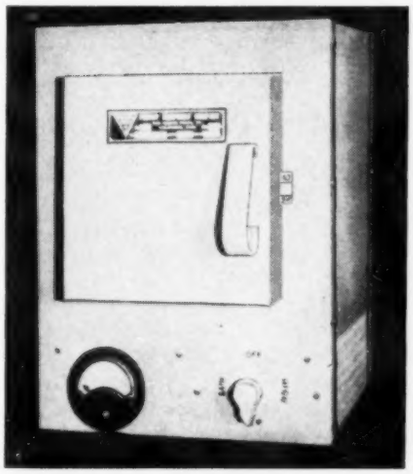
FURNACE — *Surface Combustion Corp., Toledo 1, Ohio.* This Universal Laboratory furnace has accessories that permit its use as a direct-fired unit, a muffle unit, or as as pot-type unit.



GAS CARBURIZING FURNACE — *Industrial Heating Div., General Electric Co., Schenectady, N. Y.* A line of gas carburizing furnaces in which a fan located on the furnace cover distributes the carburizing gas through the charge are cylindrical with maximum temperatures of 1800 F. possible. The three furnaces in the new line are rated at 59.5, 77.5 and 110 kw.

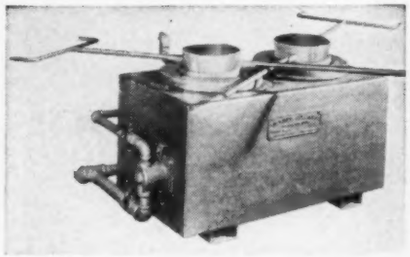


FURNACE—*Cooley Electric Mfg. Corp., Indianapolis, Ind.* A counter weighted vertically operated door for use where only partial door opening to furnace is required, is available as an alternate design on muffle-type electric furnaces. In the standard design a hinged door opens downward.

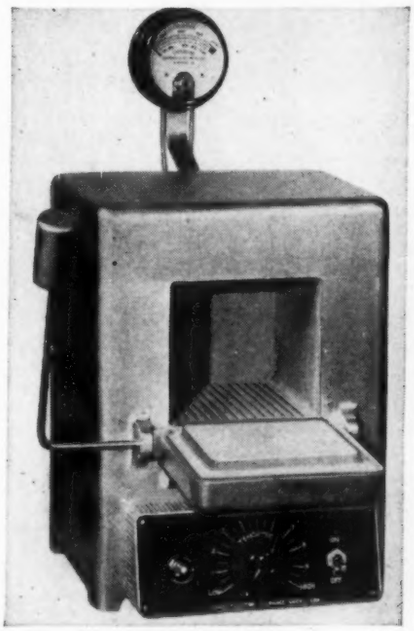


SMALL FURNACE—*Pereny Equipment Co., 842 N. Pearl St., Columbus, Ohio.* Pereco Model 220-W furnace utilizes temperatures up to 1850 F. The furnace operates on 115 volts, drawing 1500 watts.

ATMOSPHERE FURNACE—*Surface Combustion Corp., Toledo 1, Ohio.* Furnace can produce the proper atmosphere for gas carburizing, also is applicable for general heat-treating. Instead of circulating all the gas in the muffle through the enriching system, thus tending to cool the entire amount, only about 10% is removed from the muffle at any time.



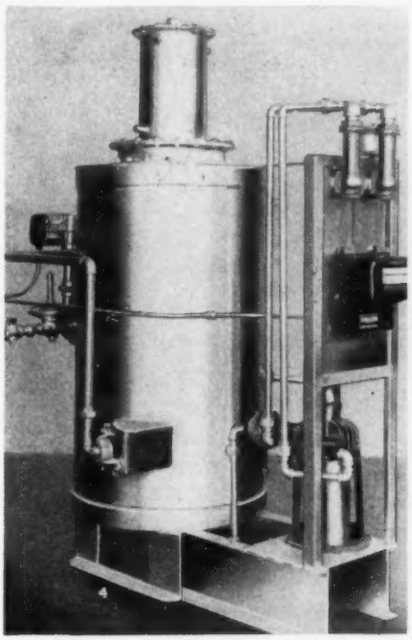
MELTING FURNACE—*Kindt-Collins Co., 12651 Elmwood Ave., Cleveland 11, Ohio.* An aluminum melting furnace of 50 or 100-lb. capacity can be gas or oil fired. The aluminum can be melted in and poured directly from the alloy metal pot.



SMALL FURNACE—*Thermo Electric Mfg. Co., 480 W. Locust St., Dubuque, Iowa.* An electric furnace, Model CEA, for production heat-treating of small parts or general laboratory use. The heating chamber is 4¾ in. wide, 4½ in. high, and 6 in. deep. Any temperature from 500 to 2,000 F. can be held.

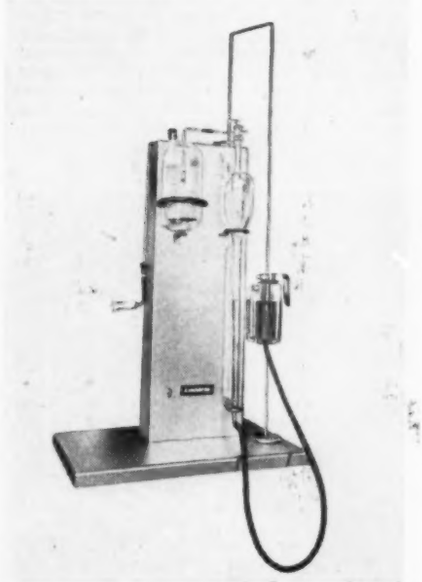
CAPACITORS—*Aerovox Corp., New Bedford, Mass.* Higher kva. ratings from a given bulk are possible with Series 1780 water-cooled mica capacitors for induction furnaces. Mica stacks are in an oil bath with cooling coils for efficient transfer of heat.

FURNACE COATINGS — *Brickseal Refractory Co., 1029 Clinton St., Hoboken, N. J.* Brickseal Special, a water-mix material of heavy cream consistency when properly mixed, is used to seal refractory walls against ingress of air or leakage of furnace atmosphere. It will withstand operating temperatures of 2750° F. 36-X Super Duty Veneer is for furnace floors and door jambs.



GAS-CRACKING UNIT—*Bellevue Industrial Furnace Co., 2971 Bellevue, Detroit 7, Mich.* Gas-cracking unit to provide a protective inert atmosphere for heat-treating furnaces is effective in temperatures above 2450 F. Natural or manufactured gas can be used. Results through an unusually wide range of atmospheric requirements can be obtained by adjusting the fuel-air ratio.

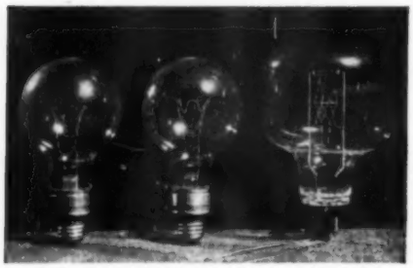
ATMOSPHERE GENERATOR—*Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill.* HYEN Hydryzing Generator is a fully automatic central station unit that can furnish atmosphere for a number of furnaces. The unit operates by city gas, natural, propane, or butane for both atmosphere and heating. It is built in four sizes, 500, 750, 1500, and 2500 cfh.



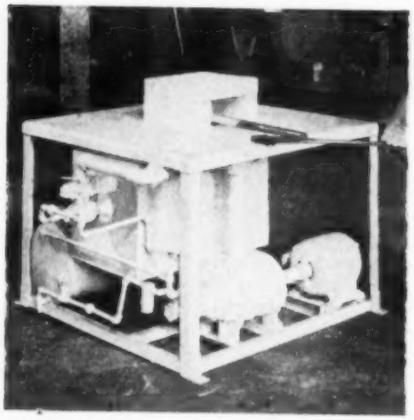
CARBON DETERMINATOR—*Lindberg Enginering Co., 2444 W. Hubbard St., Chicago 12, Ill.* Volumetric-type carbon determinator is intended for use with combustion-tube furnaces. An accuracy of one point of carbon or better is said to be possible.

WELDING AND HEAT-TREATING—Furnaces and Heaters

QUENCHING PRESS — *Gleason Works, 1000 University Ave., Rochester 3, N. Y.* Gears and other parts are held in quench so they may be hardened without distortion in the No. 16 quenching press. Parts with outside diameters up to 15 in. can be handled. Production capacity ranges from 10 to 120 pieces per hr.

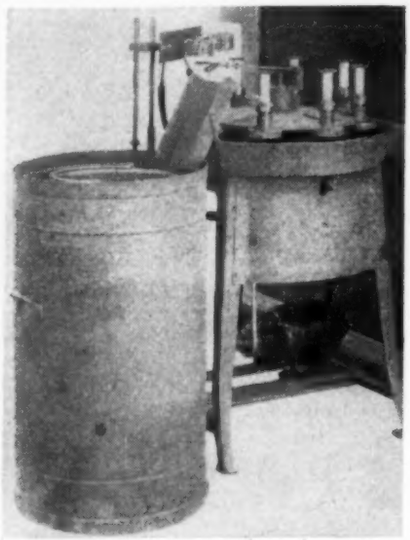


INFRA-RED LAMPS—*General Electric Lamp Dept., Nela Park, Cleveland, Ohio.* Three new infra-red industrial lamps, are (left to right) 250, 375, and 500 watt. The two smaller lamps, designed for open reflector ovens, are interchangeable. The 500-watt lamp has a medium bipost base and 6-in. flexible leads.

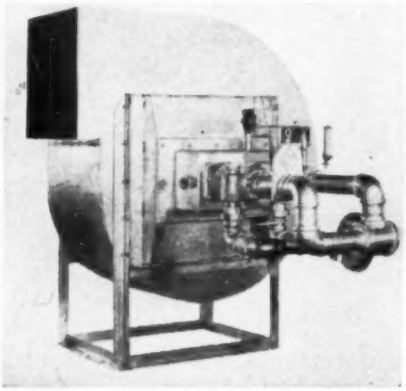


METAL-HEATING FORGE — *Diamond Iron Works Inc., Minneapolis 11, Minn.* A metal-heating forge which has a fuel supply tank, pump, motor, blower, burner and combustion chamber combined in the unit.

GAS ANALYZER — *General Electric Co., Schenectady, N. Y.* Thermal gas analyzer, Type TB, for continuously recording or indicating concentration of one component of mixed gases. A change of the instrument gas scale and a new cell block, which contains the reference gas, permits an analyzer designed for one atmosphere to be applied to one that is radically different.



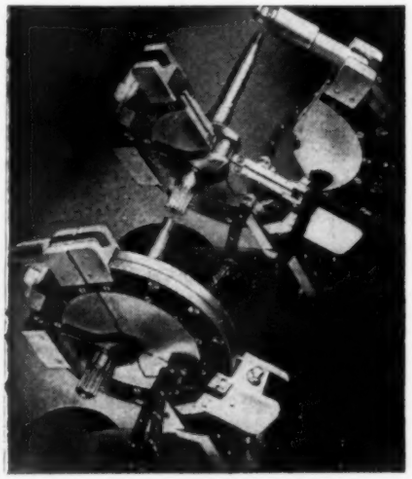
ROTARY FEED TABLE—*Scientific Electric Div. of "S" Corrugated Quench Co., 107-119 Monroe St., Garfield, N. J.* Rotary gear-hardening table with eight carrier positions has an 18-kw. high frequency induction heating unit. Can be adjusted to index at varying times from 4 to 10 sec. depending upon the size of the gear.



HEATER—*Surface Combustion Corporation, Toledo 1, Ohio.* Scroll-type heater designed for use in convection heating applications.

DIELECTRIC HEATER—*The Girdler Corp., Louisville, Ky.* Portable Model 88x0 Red Head Thermex high-frequency dielectric heating unit, has an output of 5 kw. delivered at 20 megacycles and raises the temperature of 4 pounds of average purpose plastic material 170 F. in 1 minute.

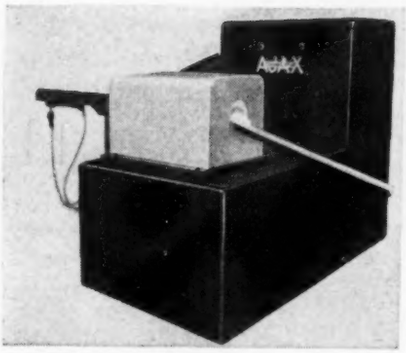
NEUTRALENE GAS PRODUCER—*Industrial Heating Div., General Electric Co., Schenectady, N. Y.* Neutralene gas producing equipment provides a neutral, CO_2, free, dry, combusted gas for heat-treating medium- and high-carbon steels without decarburization. The atmosphere produced is said to be suitable for bright annealing, clean hardening, furnace brazing and sintering.



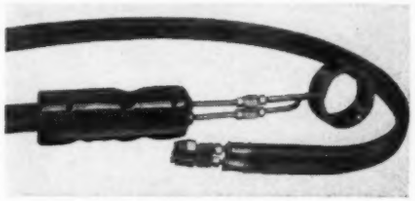
INDUCTION HARDENING — *Induction Heating Corp., 389 Lafayette St., New York 3, N. Y.* Thermonic multiturn split coil consists of two or more turns, made of machined copper plates, which are split and hinged to allow the coil to be opened, the work inserted in place and the coil closed and clamped.

ELECTRONIC GENERATOR—*Induction Heating Corp., 389 Lafayette St., New York 3, N. Y.* A combination induction and dielectric heating generator, Ther-Monic M-285 C, has two separate, interchangeable oscillator sections, one for induction and one for dielectric heating. The generator operates on 205 to 245 volts, 60 cycles, single-phase current. The full-load input is 12 kva. and output is 285 Btu. per min.

ELECTRONIC HEATING UNIT—*Industrial Heating Div., General Electric Co., Schenectady, N. Y.* Plastic preforms are placed on the electrode of the oven-like preheater and the cover is closed. Cycle is automatic. The heater will accommodate the alternate operation of two presses.



INDUCTION HEATER—*Ajax Electrothermic Corp., Trenton 5, N. J.* Continuous, automatic heating of steel slugs or forging blanks is performed in the Ajax-Northrup induction heater. Production rate when heating slugs 3⅜-in. dia., 1¾ in. long to 2200 F. is 350 per hr.



INDUCTION HEATING — *Induction Heating Corp., 389 Lafayette St., New York 3, N. Y.* Flexibility of induction-heating application is provided with a flexible lead and coil with the terminal voltage of the coil reduced to minimize the danger of arc-over to the work. The heating coils used can be either single- or multi-turn coils.

INDUCTION HEATER—*Marion Electrical Instrument Co., Manchester, N. H.* A portable bench-type induction heater for clean soldering of metal to metallized glass and ceramics. It consumes 775 watts at full load and 100 watts on standby. Power is drawn only when soldering is taking place.

COLD-TREATMENT UNIT — *Super-Treat, Inc., 3412 Beekman St., Cincinnati 23, Ohio.* For industrial cold treatment the Flash Freeze unit operating with dry ice, can be cooled from room temperatures to —130 F. in approximately two hours. The mechanical equipment includes only a motor and vacuum pump.

INDUCTION FURNACE—*Ajax Engineering Corp., Trenton, N. J.* 20-kw. induction melting furnace for aluminum alloys can be placed on the floor anywhere near the die-casting machine without a foundation. Gentle stirring of the bath is maintained, avoiding segregation of important ingredients.

INDUCTION HEATING GENERATOR — *Induction Heating Corp., 389 Lafayette St., New York 3, N. Y.* The largest and most versatile in the line of Ter-Monic induction heating generators, Model 1400, when fully loaded is capable of delivering an output of 1400 Btu. per min., or approximately 25 kw.

DIAL THERMOMETER—*W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill.* Stainless-steel thermometer is made in 3- and 4-in. dial sizes. The pointer is fixed to the shaft, and the shaft to the coil without the use of gears.

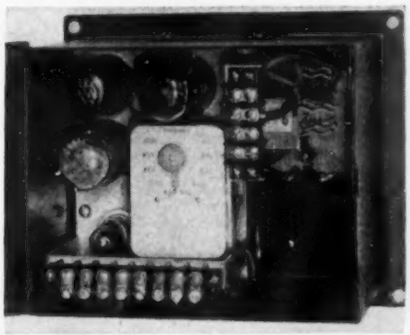
TEMPERATURE CONTROL—*Claude S. Gordon Co., 3000 S. Wallace St., Chicago 16, Ill.* With the Xactline temperature control, power "on-off" cycles as short as 3 sec. have been attained. It is said to keep variation as low as 1/5 of a deg. F.

TEMPERATURE REGULATOR — *Washington Glass Laboratory and Instrument Co., 3224 Georgia Ave., N.W., Washington 11, D. C.* Mercury temperature regulator has a signal light that glows while the temperature is rising and shuts off when setting temperature is reached. The Mercuroplat Thermo-regulator can be used for controlling ovens or bath temperatures within the range from —30 F. to +500 F.

HEAT-TREATING CONTROLLERS —*Automatic Temperature Control Co., Philadelphia 44, Pa.* Stress relief and annealing program controller that will control heat gain or loss and time cycles for variations. Knob adjustments set heat rates in degrees per hour and times for maintenance of rates.

THERMOCOUPLE TUBES — *Minneapolis-Honeywell Regulator Co., Wayne & Roberts Ave., Philadelphia, Pa.* Cast-iron thermocouple protecting tubes have a uniform wall thickness to within plus or minus 1/32 in. They are cast with both ends open, permitting positive support for the core at each end.

STACK AND DRAFT METER—*Davis Emergency Equipment Co., Inc., 45 Halleck St., Newark 4, N. J.* A portable instrument, the Stack-O-Meter, for indicating CO_2, stack temperature and draft readings. The meter dial reads 0 to 20% CO_2 in black figures, temperature on a red scale 0 to 1000 F. and draft in tenths of inches of water on a green scale.



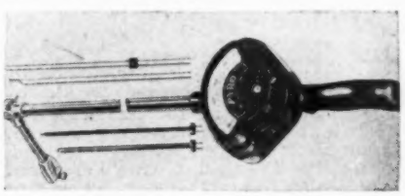
THERMAL PROTECTOR—*Manning, Maxwell & Moore, Inc., Bridgeport 2, Conn.* A thermocouple-actuated limit switch, the Ashcroft Thermal Protector, is intended for protection of ovens, dryers, large bearings, injection presses, and other equipment. When the temperature limit set on the operating knob is reached, the unit will stop the apparatus.

THERMOSTAT—*United Electric Control Co., Boston 27, Mass.* Type O industrial thermostat can be used for all liquid or gases non-injurious to brass. Control is based on a snap-action switch actuated by a liquid-filled copper thermo-assembly.

SCHEDULE CONTROLLER — *Foxboro Co., Foxboro, Mass.* For batch processes and other operations where rate of temperature increase or decrease must be controlled, as well as the actual processing temperature and duration. Control is completely automatic, according to whatever schedule is predetermined.

PORTABLE THERMOCOUPLE — *Brown Instrument Company, Philadelphia, Pa.* A portable thermocouple for measuring molten aluminum temperatures is suitable for other low melting-point metals. Metal temperatures can be measured below the surface of the bath in a few seconds, and the readings are unaffected by couple wire conditions.

PORTABLE PYROMETER—*Wheelco Instruments Co., 847 W. Harrison St., Chicago, Ill.* Extension-type portable pyrometer for use where a universal instrument is required has a choice of plug-in angle extensions. The extensions are available in either straight, 45 or 90° angle types.



PYROMETER—*The Pyrometer Instrument Co., 103 Lafayette St., New York 13, N. Y.* Immersion pyrometer designed primarily for non-ferrous use has the 4-in. direct-reading scale calibrated from 0 to 1500 or 2500 F. Two models have over-all lengths of 27 and 43 in., with a swivel 8 in. from the connector block.

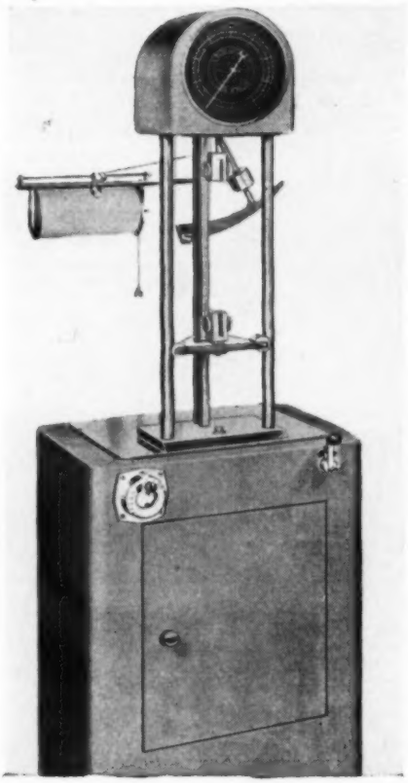
SURFACE PYROMETER—*Pyrometer Instrument Co., 103 Lafayette St., New York 13, N. Y.* An improved surface pyrometer for measuring metallic or non-metallic surfaces is mounted in a rubber-cushioned steel housing. Eight different thermocouples and two types of extension arms are included with the set.

Layout and Inspection

LEAD COMPARATORS — *Michigan Tool Co., 7171 E. McNichols Rd., Detroit Mich.* Models 1200 and 1200A are intended for use on the production floor. The comparators have master multiple thread leads, followers, indicators and actuating mechanisms inclosed. External and internal gears with a maximum swing of 10 in. may be checked as well as worm gears. For a helix up to 45°, Model 1200 is used. For larger helices and to check the leads on worms, Model 1200A is used.

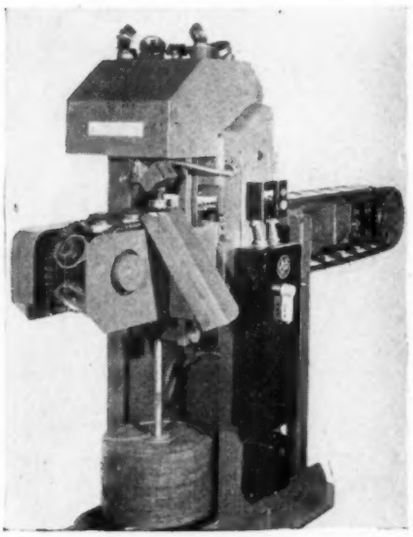
GAGE HEADS—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* Class B gaging heads from 0.240 to 2.510 in. in dia. are for use with the Federal-Metricator air gaging system. Principal difference from the regular gaging head is that they are not chrome-plated and lapped. They are hardened steel.

BRINELL TESTER—*Steel City Testing Laboratory, 8843 Livernois Ave., Detroit 4, Mich.* A hardened steel plate on the base of the machine, 3 in. from the floor, provides a solid foundation for supporting the specimen to be tested. This machine, Type A4, can be set up in an assembly line or in any position to suit testing requirements.

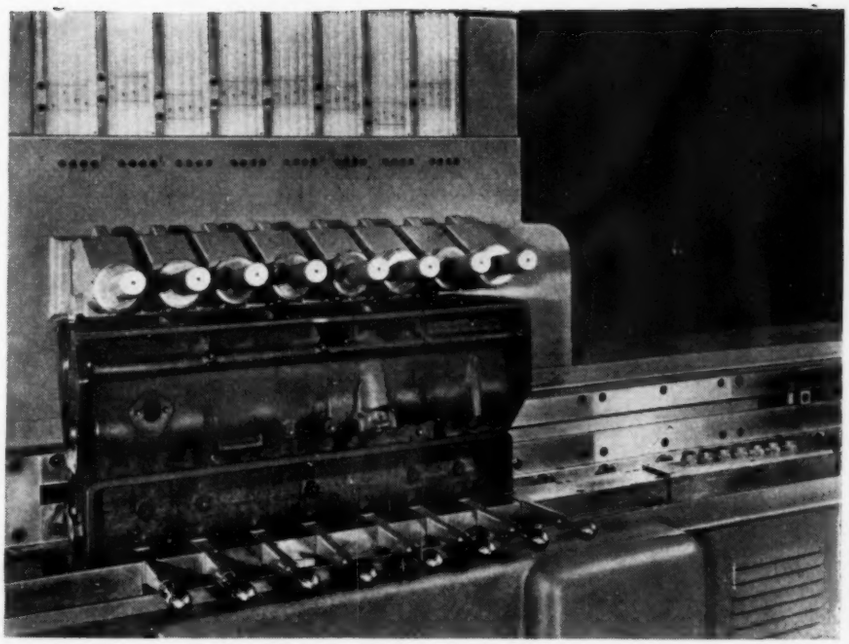


LOW-RANGE TESTER—*W. C. Dillon & Co., Inc., 5410 West Harrison St., Chicago 44, Ill.* Four separate capacities are incorporated in physical tester. Capacity ranges are 0-10 lb. in 1 oz. dial divisions, 0-25 lb. in 2 oz., 0-50 lb. in 4 oz. and 0-100 lb. in 8 oz. divisions.

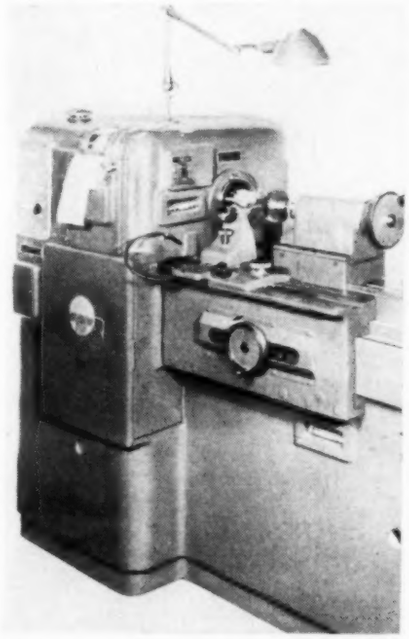
TESTING MACHINE—*Steel City Testing Laboratories, 8843 Livernois, Detroit 4, Mich.* Model TR-1 transverse testing machine with a capacity of 10,000 lb., is hydraulically operated with the load applied automatically at speeds to suit the operator. The machine has a 24-in. maximum span and a 4-in. opening.



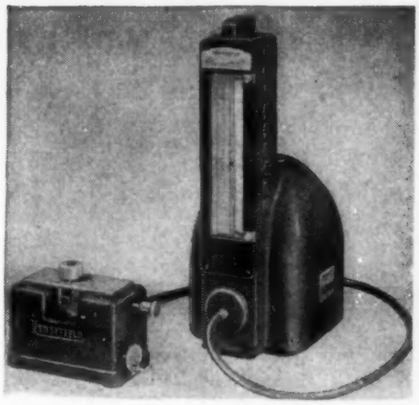
RUBBER TESTER—*Ling Engineering Co., 13845 Elmira Ave., Detroit 27, Mich.* An inspection machine for rubber engine mounts can be adapted to the testing of springs, clutch assemblies and other resilient products. Accepted parts travel to the conveyor-track end and drop into a container. If the mount exceeds tolerances, the solenoid is energized to pick up that mount and reject it.



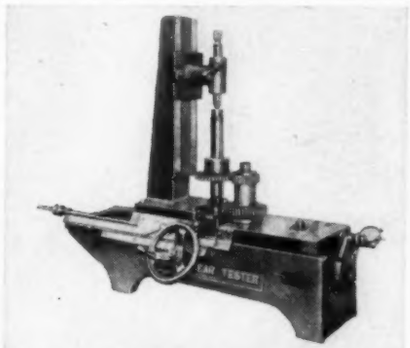
CYLINDER BORE GAGE—*Sheffield Corp., Dayton, Ohio.* Designed as an integral part of a production line, the instrument checks for diameter, taper, and out-of-roundness of eight cylinder bores at four different points in each cylinder, and accurately classifies them to 0.0003 in. Hydraulically operated, electrically controlled, and gaging by air flow, it will accomplish one complete cycle in less than 60 sec.



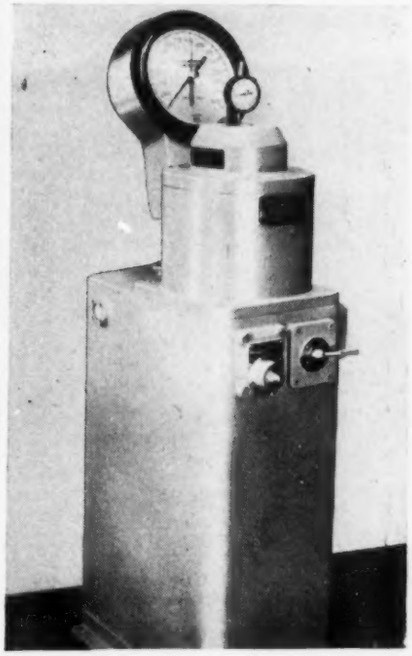
GEAR CHECKER—*The Fellows Gear Shaper Co., Springfield, Vt.* Instrument precisely checks the lead of helical gears and other surfaces. If there is an error in lead, the indicator needle shows to 0.0001 in. the displacement of the helix in the face width being measured. An electrical recorder automatically produces a record of tooth face displacement on a paper chart. In addition to checking the lead of helical gears the instrument can be used for checking taper and crowning of spur and helical gear teeth. Gears up to 12 in. pitch diameter can be checked.



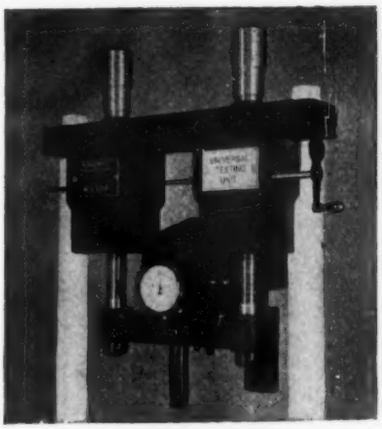
INTERNAL PRECISIONAIRE—*Sheffield Corp., Dayton 1, Ohio.* Precisionaire internal measuring instrument is for accurate checking of small rings from 5/32- to 1-in. internal diameter. The rings may be explored to a depth of 9/16 in. from each side. Deviations of five millionths of an inch are represented by 0.175 in. on the scale.



GEAR TESTER—*George Scherr Co., 200 Lafayette St., New York 12, N. Y.* Two new models of the Parkson Gear Tester have a maximum capacity of 15 in. center distance. One of the new models is equipped with a box-shaped upright which provides vertical centers for holding gears or pinions mounted on shafts or arbors. The other model is designed for testing internal gears.



DUCTILITY TESTING MACHINES—*Steel City Testing Laboratory, 8843 Livernois Ave., Detroit 4, Mich.* The Model PA-2 has a 15,000-lb. capacity for stock up to ⅛-in. thickness, and the Model PA-3 has a 30,000-lb. capacity for stock up to ¼-in. thickness. The load is applied automatically.

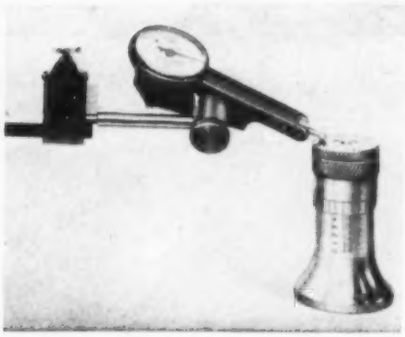


UNIVERSAL TEST UNIT — *Wilson Mechanical Instrument Co., Inc., 383 Concord Ave., New York, N. Y.* A universal testing unit for heavy or large work which cannot be handled in standard Rockwell hardness testers. The unit is mounted in a rigid supporting frame designed to suit the particular application.

BEARING-RACE TESTER — *The Physicists Research Co., Ann Arbor, Mich.* Tester measures the waviness of bearing races, both inner and outer, in microinches RMS. The microinch height of the waviness is indicated directly on two meters. It is a production instrument designed for use in race grinding departments.

SPRING TESTING UNIT—*Rinck-McIlwaine, Inc., 16 Hudson St., New York 13, N. Y.* Springs up to 2 in. in diameter and 4½ in. in length are tested in the Rimac spring tester. The tester has a dial face 4½ in. in diameter for easy reading. The dial reads in pound units up to 250.

LAYOUT AND INSPECTION



GAGE — *Accurate Machine Products Co., 1640 S. Hobart Blvd., Los Angeles 6, Calif.* Micro-Planer Gage provides a means for setting measurements accurately in thousandths of an inch. It is designed for setting cutting tools on planers and shapers, and may be used as a carriage stop for lathes.

INTERNAL INDICATOR — *Swedish Gage Co., 8900 Alpine, Detroit 4, Mich.* Mikro-Internal is graduated in 0.0001 in. with a scale range of 0.006 in. and for closer tolerances can be had with a scale range of 0.0024 in. graduated in 0.00005 in. Standard measuring depth is 4 in.

DIAL BORE GAGE—*Standard Gage Co., Poughkeepsie, N. Y.* The No. 0 dial bore gage is furnished with an indicator graduated in either 0.0001 in. or 0.002 mm. It extends range of this type of instrument down to ¾ in.

UNIVERSAL INDICATOR — *Federal Products Corp., 1144 Eddy St., Providence, R. I.* A Testmaster universal indicator with the dial perpendicular to the axis of the instrument makes for improved readability in many operations. Models 5 and 6 (English) are graduated 0.001 in. and 0.0001 in. Models 7 and 8 (Metric) are graduated 0.0025 and 0.01 mm.

DIAL INDICATOR—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* This gage can be used on holes as small as 0.122 in. and up to 0.250 in. Holes can be handled to depth of 2¾ in. Variations within the range are obtained by the use of a set of 12 interchangeable gaging plugs. Model 1203 P-1, this gage is calibrated and set to reveal conditions up to plus or minus 0.004 in.

FILE GAGE—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* Special gage is for inspecting Nicholson's triangular files used to refile saw teeth. The file must be a perfect equilateral triangle, so this gage was developed to check the width. Dial indicator is used for fast operations.

INDICATOR—*Standard Gage Co., Inc., Poughkeepsie, N. Y.* These indicators have dial markings in decimals, directly comparable to blueprint tolerances. Decimatic series comprises 19 models with graduations in English and metric units.

DIAL INDICATORS—*B. C. Ames Co., Waltham 54, Mass.* The series of sensitive dial indicators, "Super," have bezel diameters 2¼ and 2¾ in. The indicators are graduated in 0.0001 in., with a range of 0.008 in., either balanced or continuous.

INDICATORS—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* Three additional "A" size dial indicators have over-all bezel diameter of 1¼ in. The indicators are Model A½Q, which is graduated 0.0001 in., Model A3Q graduated 0.0005 in., and Model A6Q2 graduated 0.001 in.

PRESSURE GAGES — *The Dayton Rogers Mfg. Co., 2835 12th Ave., S. Minneapolis 7, Minn.* Line of pressure gages with a convex, non-breakabale crystal is of the Bourdon approved type and is suitable for liquid or gas.

PLUG GAGE—*Sapphire Products Division, Elgin National Watch Company, Aurora, Ill.* Flexible rubber handles on plug gages permit the operator to approach the work within 20° of the hole axis and still obtain perfect alignment. The handle is lighter in weight than rigid ones previously used.

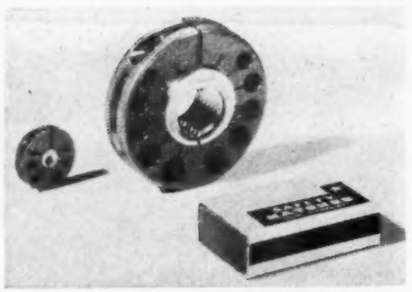
GAGE DESIGN—*Frankford Arsenal Gage Laboratory. Requests for permission to use should be addressed to Office, Chief of Ordance, Washington 25, D. C.* A set of slide rules for gage design. Two slide rules are for design of plain gages. The designer need only have component tolerance and size for determination of gage size, wear allowance, and gage tolerance. A slide rule for the design of thread gages enables the gage designer to obtain the data necessary for the design of thread plugs, thread rings, and setting plugs for National Special Threads.

THREAD PLUG GAGES—*George O. Griffin Co., 1301 W. Hadley St., Whittier, Calif.* Chrome-carbide type thread plug gage with reversible gaging elements. As wear is normally concentrated on the first few threads of the gage, reversing the gaging element doubles the life of the gage. The gages are available from ¼ to 1½-in. dia.

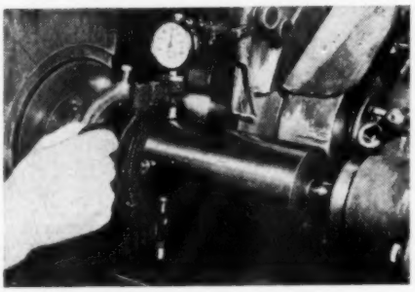
TAPER GAGES—*Moore Special Tool Co., Inc., 740 Union Ave., Bridgeport 7, Conn.* Direct-reading leaf taper gages are used for checking the size of trial cuts in bringing the hole up to size during boring or grinding. 36 individual gages check hole sizes from 0.095 to 1.005 in. The leaf gages are accurate to 0.00025 in. Graduations on each size overlap the next by 0.010 in.

PLUG-GAGE BUSHINGS—*The Carboloy Co., Inc., 11147 E. Eight Mile, Detroit 32, Mich.* 40 standard sizes of Carboloy go and no-go plug-gage bushings in rough form ready for finishing. Bushings range in size from a finished gage diameter of 0.366-0.406 in. to a finished gage diameter of 1.501-1.531 in.

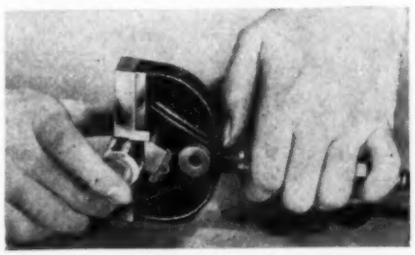
PLUG GAGES—*Barnaby Mfg. and Tool Co., Bridgeport, Conn.* Adjustable plug gages for diameters for 0.375 in. to 1.500 in. can be used both for the inspection of inside diameters and for checking bellmouth and out-of-roundness. Adjustment of the gages is made by turning the knurled endpiece.



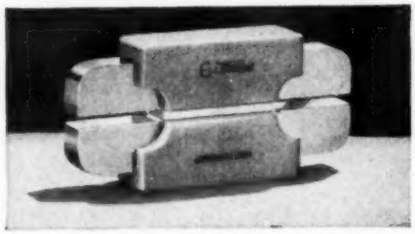
ADJUSTABLE GAGES—*N. A. Woodworth Company, Detroit, Mich.* A gaging instrument that assures roundness through the maximum range of adjustment and distributes wear over 360°. The gage is adjusted along the helix angle of the thread, thus preventing a jump lead at the adjusting slot.



SNAP GAGE—*Standard Gage Co., Poughkeepsie, N. Y.* Demountable heads and extension spacers feature the Decimatic Dial Snap Gage. A single pair of heads and four extension spacers of different length cover a range of 4 in. Both gaging pins are surfaced with cemented carbide.



GAGING FIXTURES—*Sheffield Corp., Dayton, Ohio.* Standard adjustable Airsnap fixtures for use with Precisionaire instruments provide flexibility in checking external dimensions with air and are available in eight models covering a range from 0.250 to 2.000 in. Special airsnaps may be used for checking tolerances of 0.0002 in. down to ten-millionths or less.

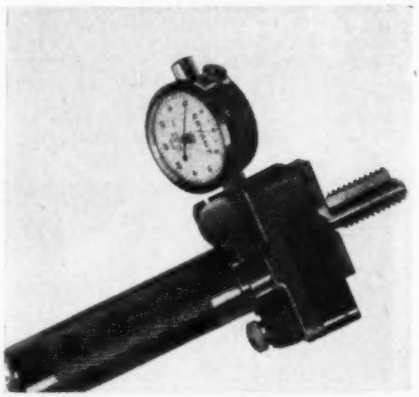


SNAP GAGES—*Dearborn Gage Co., 22038 Beech St., Dearborn, Mich.* Ellstrom "Mastersnap," consists of a special gage block wrung between a pair of chromium-plated alloy-steel jaws and locked in position by brass thumb fasteners. Special gage blocks are available in sizes from 0.050 to 2.000 in., used separately or in combination.

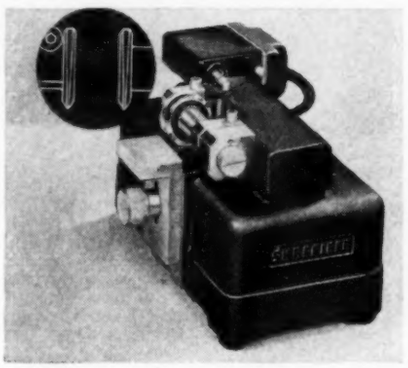
WIRE PLUG GAGES—*Van Keuren Co., Watertown 72, Mass.* Carboloy wire-type plug gages and thread-measuring wires. The plug gages are made in any size from 0.020 in. diameter to ¼ in. diameter. They are made with a Class B tolerance of ±0.000025 in. A life of 50 times that of tool steel is realized with carboloy gaging units. However, owing to small pits in the sintered material they are not recommended where accuracy to the exact 0.0001 in. is necessary.

MEASURING WIRES—*Lincoln Park Industries, 1719 Ferris Ave., Lincoln Park 25, Mich.* Thread and gear-measuring wires made of cemented carbide are supplied in sets of three contained in glass bottles. Wires for N.S. 4 to 36 pitch are available from stock, others on special order.

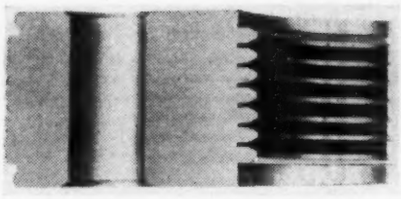
GEAR-MEASURING WIRES — *The Van Keuren Co., 176 Waltham St., Watertown, Mass.* Set of Carboloy gear-measuring wires, No. 20-1.68C, includes two wires each from 7 diametral pitch, 0.240-in. dia., to 80 diametral pitch, 0.021-in. dia.



THREAD GAGE—*Bryant Chucking Grinder Co., Springfield, Vt.* Portable gage has three thread segments. Two are stationary and one is attached to a movable arm. The movable segment can be retracted, inserted in the work without thread interference. Segments can be changed for different threads.

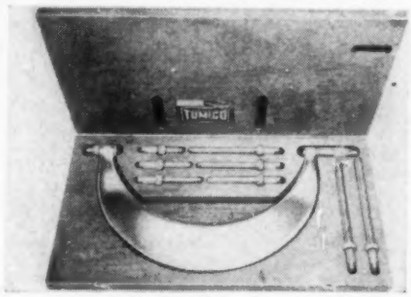


THREAD-LEAD GAGE—*The Sheffield Corp., Dayton, Ohio.* A production Leadcheck which has truncated cylindrical gaging anvils that are adjustable, makes possible precision checking of thread lead within a range of 4½ to 60 threads per in. to an accuracy of 0.0001 in.



THREAD RING GAGES—*Locke Gage Co., 10232 Woodward Ave., Detroit 2, Mich.* Thread ring gages with clearance below the roots of the threads make it possible to take full advantage of the adjustment provided without the set plug coming in contact with the root of the thread. It is possible to lap the entire side of each thread from crest to root.

MICROMETER — *Sapphire Products Div., Elgin National Watch Co., 932 Benton St., Aurora, Ill.* Anvil and spindle of the micrometer are tipped with sapphire with accuracy guaranteed within 0.0001 in. The micrometer is available in 1-in. to 6-in. sizes in the English and metric systems.



MICROMETER—*Tubular Micrometer Co., St. James, Minn.* Bores can be measured without removing boring bars with the tubular over-the-bar inside micrometer. The micrometer has a hollow box-type steel frame which is rigid and light. Standard range of sizes is from 8 to 28 in. and will cover bar diameters from 4 to 8 in.

TUBULAR MICROMETER—*Tubular Micrometer Co., St. James, Minn.* Tubular "Feather Touch" micrometers are available with the spindle and anvil tips mounted with sapphire wearing surfaces. The series is available in 1-, 2-, and 3-in. sizes.

TACHOMETER — *Special Products Div., General Electric Co., Schenectady, N. Y.* An electronic tachometer designed for measuring rotating speeds from 300 to 50,000 rpm., weighs 19 lb., and is intended for production testing of equipment without permanent attachment.

HAND TACHOMETERS — *O. Zernickow Co., 15 Park Row, New York 7, N. Y.* Improved line of O-Z hand tachometers can be used for checking either the revolutions per minute, or the surface speeds. Each tachometer has five ranges selected by a rotating gear shift. No. 12 is for 30 to 12,000 rpm., No. 24 is for 60 to 24,000 rpm., and No. 48 is for 120 to 48,000 rpm.

TACHOMETER RECORDER—*Meter and Instrument Div., General Electric Co., Schenectady 5, N. Y.* Inkless recorder provides a record of rotating speed and can be used with any ac. tachometer generator of suitable characteristics. It has a scale range from 0 to 3,000 rpm. Readings are accurate to within 1.5% of full scale.

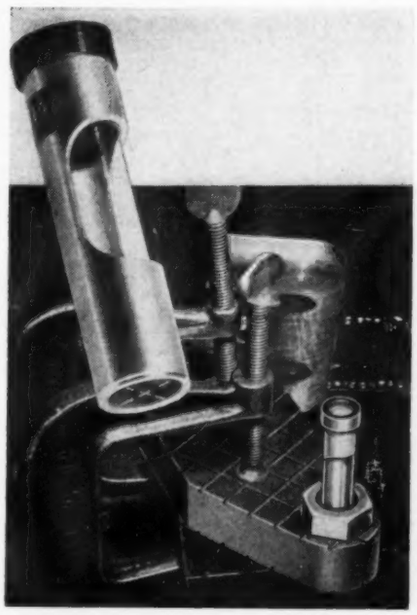
TACHOMETER — *Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* The generator or "pick-up unit" is permanently mounted on a machine; the meter can be mounted on a panel which is 200 or more feet away. Meters are available in 3- and 7-in. sizes with scales of 1250, 2500, and 5000 rpm.

TACHOMETERS—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Direct measurement of speeds down to 10 rpm., and 1 fpm. are available with the type 25B low-speed tachometer. Direction of rotation does not affect the reading.

TACHOMETERS—*George Scherr Co., 200 Lafayette St., New York 12, N. Y.* Five speed ranges and a large knurled ring provide speedy shifting. Made in four models—Model A, from 30 to 12,000; B from 45 to 18,000; C from 60 to 24,000; and D from 120 to 48,000 rpm.

SWITCHBOARD TACHOMETER — *Metron Instrument Co., 432 Lincoln St., Denver 9, Col.* Tachometer heads can be mounted at five different machines. A rotary selector switch on the indicating unit selects the machine whose speed is to be measured. The scale shows three separate speed ranges from 1 to 50,000 rpm.

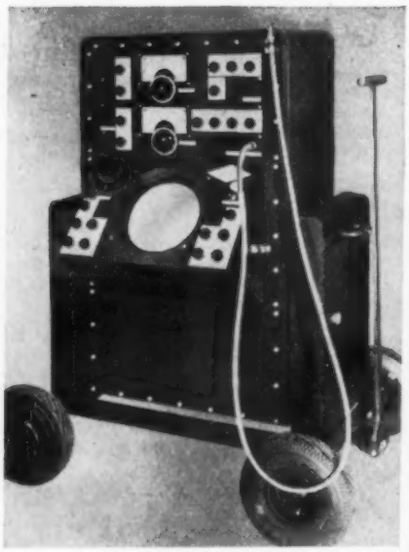
SURFACE STANDARDS—*University Machine Co. Div. of Baird Associates, Cambridge, Mass.* Set consists of 20 small blocks of stainless steel, each of which is machined to the surface finish specified for one of the standards. Finish of a part can be checked by drawing the finger nails across the specimen and across the standard.



OPTICAL CENTERING TOOL—*Benton Co., 351 S. La Brea Ave., Los Angeles 38, Calif.* The Opti-Setter can be used to locate templets in proper relation to workpieces, center drill jigs to reference marks or to layouts, or as an inspection tool. It is made in two sizes: ½-in. dia. by 3-in. long, and ¾-in. dia. by 3-in. long.

OPTICAL FLATS—*Optron Laboratory, 2651-B Salem Ave., Box 25, Dayton 6, Ohio.* Optical flats of square and rectangular shape for checking gage blocks and other precision articles are said to be more economical and easier to handle than those of round shape.

LAYOUT AND INSPECTION



NON-DESTRUCTIVE TEST—*Sperry Products, Inc., 15 & Willow Aves., Hoboken, N. J.* Supersonic Reflectoscope measures the length of time it takes vibrations to penetrate the material under test, reflect from the opposite side, or an internal defect, and return to the sending point. The pattern on oscilloscope screen indicates location of defects in the material under test. Depth of penetration may be up to 10 ft. if required.

GAGE BLOCKS—*DoAll Co., 1301 Washington Ave. S., Minneapolis 4, Minn.* Gage blocks are made of Do-Alloy, a wear-resistant alloy having expansion characteristics equivalent to steel, which permits using the blocks with a high degree of accuracy under any temperature condition.

GAGE BLOCKS—*Webber Gage Co., 12901 Triskett Rd., Cleveland 11, Ohio.* Accurate to within 1/5,184,000 part of a circle the blocks produce any angle from 0 to 103° in steps of 1". Working surfaces are optically flat and blocks wring together in the ordinary way.

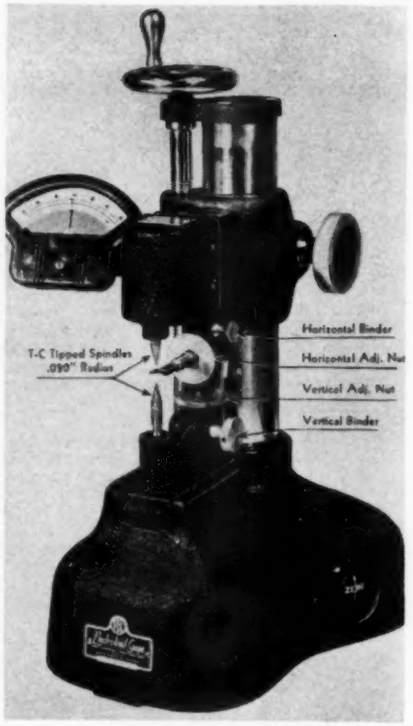
INTERFERENCE VIEWER—*Optron Laboratory, 2651-B, Salem Ave., Box 25, Dayton 6, Ohio.* Uniformly accurate measurements of precision articles is said to be possible with the Interference Viewer. Interference patterns are both viewed on a line perpendicular to the plane of the pattern.

HYPERSONIC TESTING — *Brush Development Co., 3311 Perkins Ave., Cleveland, Ohio.* Method for nondestructive testing whereby a sound generator sends a supersonic vibration through a specimen. Applicable to materials having constant cross-section.

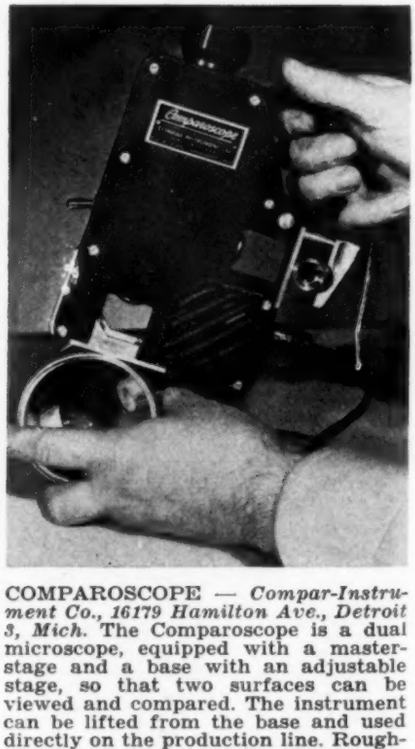
GAGE COMPONENTS—*Gage Div., DoAll Co., Minneapolis, Minn.* Producto-Check consists of a number of instruments to be used in conjunction with gage blocks for setting up any type of inspection gage. Dial-indicating snap gages, plain bench comparators, dual bench comparators, angle comparators, precision height gages, depth gages and go-no-go snap gages up to 18 in. can be made.

VACUUM GAGE—*Glenn L. Martin Co., Baltimore 3, Md.* Instrument gage measures the thickness of metal sheets by the pressure principle. It can also be used for inspection of the bonds between the layers of laminated materials. Readings are made on the dial indicator with normal pressure inside the cup and with the air evacuated from the cup. The vacuum causes a deflection of the sheet which is recorded by the indicator.

ADJUSTABLE COMPENSATOR — *Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.* An adjustable compensator has been announced which can be attached to the P&W Model B2 Air-O-Limit comparator. The adjustable compensator allows full scale graduations of 0.0004, 0.0006, 0.0008, and 0.001 in. to replace the full scales of 0.002, 0.003 and 0.004 in. that are normally used.

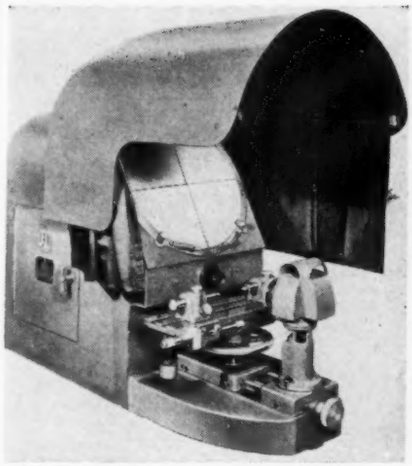


BALL COMPARATOR — *Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford, Conn.* Model CE-699 Electrolimit external comparator is equipped with a special gaging spindle, anvil, and backstop for the inspection of balls. The meter can be graduated in 0.0001-, 0.00005-, or 0.00001-in. increments.

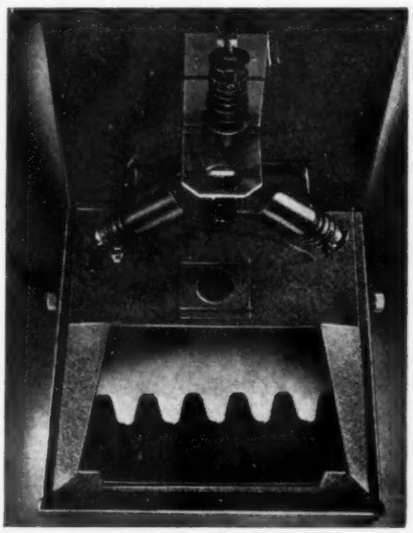


COMPAROSCOPE — *Compar-Instrument Co., 16179 Hamilton Ave., Detroit 3, Mich.* The Comparoscope is a dual microscope, equipped with a master-stage and a base with an adjustable stage, so that two surfaces can be viewed and compared. The instrument can be lifted from the base and used directly on the production line. Roughness is indicated by surface brightness.

DEFLECTION PICK-UP — *Stevens-Arnold Co., 22 Elkins St., S. Boston, Mass.* A hermetically sealed electrical unit which translates minute deflections or pressure variations, applied to its plunger, into linear changes in its dc. output voltage.



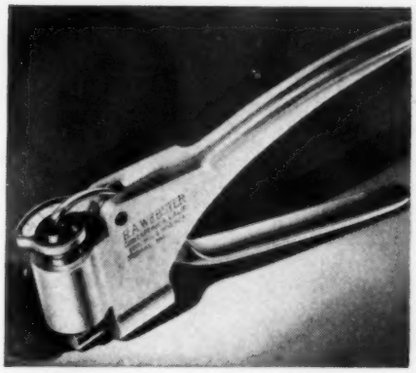
COMPARATOR—*The Jones & Lamson Machine Co., Springfield, Vermont.* Three improved models of optical comparators: Standard bench Model BC-6 with 6x8-in. screen and a table for making lateral measurements of lead or spacing up to 2 in. either way. Bench Model BC-5 with a 14-in. dia. screen and a table, for making measurements of lead or spacing up to 2 in., will accommodate objects held between centers up to 3 in. in dia. and 8 in. long. Vertical Model VC-2 with a 14-in. dia. screen and a coordinate measuring table for flat objects.



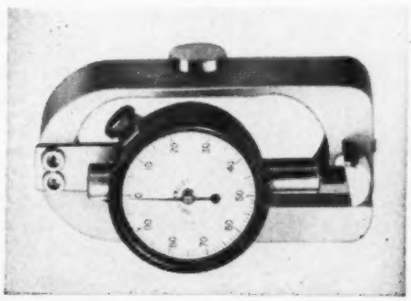
COMPARATOR—*Sheffield Corp., Dayton 1, Ohio.* An optical comparator with an adjustable screen, the Fish-Schurman, has centering device which enables the master pattern to be adjusted to the work. The standard model has a 25 to 1 amplification, while interchangeable 13 to 1 and 50 to 1 optical systems are available. The comparator can be used in either a horizontal or vertical position. The construction permits a number of uses in addition to checking and inspecting contours.

SCRIBING PLATES—*Eastman Kodak Co., Rochester 4, N. Y.* Kodak Green Scribing Plate, for use with optical comparators of the contour projection type, may be used directly with the contour comparators or as printing masters for photographically duplicating the contour comparator plate. A transparent green-dyed gelatin coating is applied to glass, and tolerance lines are scribed on the plate by cutting through the gelatin film.

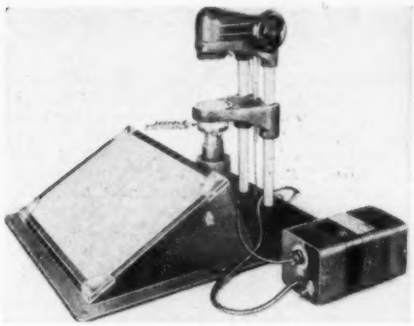
COMPARATOR—*Pollak Manufacturing Co., Arlington, N. J.* A limit-type electronic comparator inspects, sorts, and places each piece in the proper bin—undersize, oversize or acceptable. The tolerance range is 0.0001 to 0.030 in. Contact spindle pressure is adjustable from 4 oz. to 1 lb.



HAND HARDNESS GAGES—*R. A. Webster, 422 20th St., Santa Monica, Calif.* Two hardness gages, Model B and B-75, for aluminum, copper, brass and other non-ferrous metals, are used to identify materials which have been heat-treated. Compressing the handle actuates the penetrator. Model B is for aluminum alloys. Model B-75 is for direct readings on brass and other non-ferrous metals within the range from soft brass to hard brass.

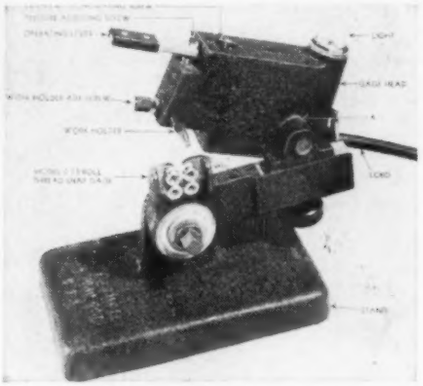


PRESSURE GAGES—*W. C. Dillon & Co., Inc., 5410 West Harrison St., Chicago 44, Ill.* Series of mechanical pressure gages of compact design can be used to check pressure between spot-welding machine electrodes, plates in presses of all types, pressure between moving rollers, and in other applications.

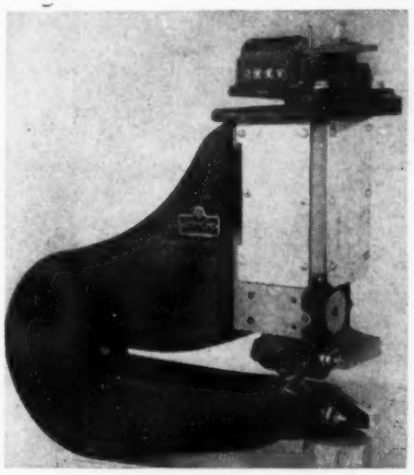


PROJECTOR—*George Scherr Co., 200 Lafayette St., New York 12, N. Y.* A surface illuminator for the Wilder Projector has a ring of eight low-voltage bulbs mounted in the compact circular lamp house which surrounds the projector lens. This intense light is directed vertically against the surface of the work.

SETTING GAGE—*F. H. Smith Mfg. Co., 3037 Carroll Ave., Chicago 12, Ill.* Form-tool setting gage is designed for resetting the cutting edge of the form tool in the same position which it held before sharpening. Adjustable-length gage is for quick checking of length dimensions. Tolerances of 0.005 and 0.010 in. are ground on either end of the adjustable limit ring. The gage can be used for various combinations of tolerances, from 0.005 to 0.020 in.

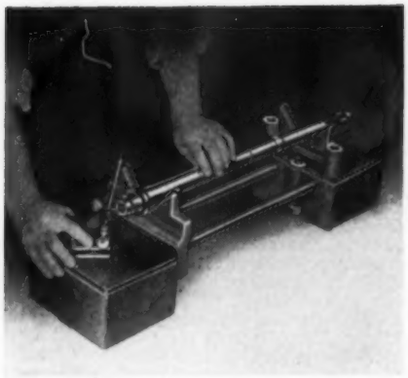


ROLL COMPARATOR — *Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Small diameter screws of fine pitch are inspected in Model C Roll Thread Comparator with pressure control. The instrument is for inspection of screws with dia. from 0.060 to 0.216 in. and threads of 80 to 28 per in. N. F. 60°.

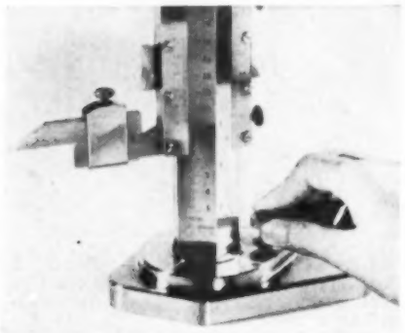


CONTINUOUS GAGE—*Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn.* Model D-10 Electrolimit continuous gage has a throat depth of 10 in. Aside from the main casting, parts are interchangeable with Model D. Accurate to 0.000025 in. under constant-temperature conditions. A remote control is available.

TEMPERATURE COMPENSATOR—*Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn.* Zero setting for all conditions of temperature in gaging strip material is possible. The lower roll stud on the gage is replaced with the temperature compensator roll stud.



V-LINER—*Swanson Tool & Machine Products, Inc., 814 E. 8th St., Erie, Pa.* The V-Liner is designed to aid in checking and inspecting relative concentricities on round parts. It determines the proper centerline height required for any combination of diameters involved in a workpiece.



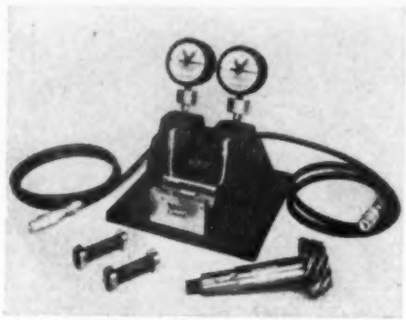
HEIGHT GAGE—*George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* 48-in. Chesterman height gage has vernier 2.450 in. long, compared with the 5 in. commonly used. Quick adjustment is obtained by pressing two lugs along the heavy beam.

INSULATION TESTER—*Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* Insulation resistance is checked with this self-contained test unit. Used for periodic check of motors, it will detect a weakness before a breakdown occurs.

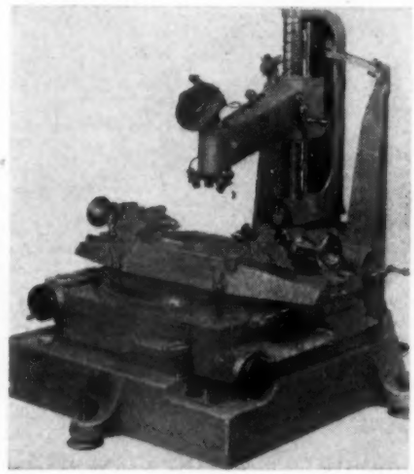
OPTICAL TOOL—*Benton Co., 351 S. La Brea Ave., Los Angeles 36, Calif.* Opti-Check measures rake and clearance angles on cutting tools. The image of the tool and the protractor are viewed through magnifying lenses.

PROFILOMETER RECORDER — *Physicists Research Co., Dept. 1, Ann Arbor, Mich.* A written record of surface roughness as measured by the Profilometer is possible with a Reading Recorder. The recorder provides a continuous chart record of the average roughness of the surface being measured.

MECHANICAL COMPARATOR—*Dow Mechanical Corporation, Thompsonville, Conn.* The Dow-Gage is a mechanical comparator incorporating a standard dial indicator. The work to be checked is placed over a pin on the stage and the depth measurement is made by movement of the pin.



V-BLOCK GAGE — *Moore Products Co., H and Lycoming St., Philadelphia 24, Pa.* A V-block pneumatic unit for measurement of one or more outside diameters for the pneumatic comparator gage. Diameters between 0.150 and 8 in. can be measured.



TOOLMAKER MICROSCOPE—*Gaertner Scientific Corp., 1201 Wrightswood Ave., Chicago 14, Ill.* Large toolmaker microscope has a mechanical stage that has a coordinate range 8 x 4 in., 360° rotary motion and that is capable of supporting several hundred pounds. The instrument includes a 30-power microscope mounted on a support column with micrometer tilt up to 15° each side of vertical. Magnifying power can be varied from 10 to 100 by means of interchangeable objectives.

INSPECTION LAMP—*Harmon & Co., 6 N. Michigan Ave., Chicago 2, Ill.* Eder-Lite has small light-reflecting and glareless metal-protected tungsten bulbs attached to a flexible or rigid extension. Power is supplied through a rubber-insulated wire cable to a transformer enclosed in a Bakelite handle. The lamp can be supplied in a special safety model.

SURFACE GAGE—*Yankee Precision Products Co., 595 New Park Ave., Hartford 10, Conn.* Automatic visual surface gage measures the flatness of machine surfaces to close tolerances. Test recordings on typical pieces are said to have indicated that variations of as little as 0.000005 may be measured. Where high or low spots appear, bulbs in matching position do not light.

ELECTRONIC GAGE HEAD—*Yankee Precision Products Co., Dept. AM-9, 50 Bartholomew Ave., Hartford, Conn.* A new electronic self-contained gage head can be connected directly to 110-volt circuit without the use of transformers. The gage head, complete within itself, can be attached to a support or stand to suit any specific applications. The plus and minus lights will operate within a gage setting of 0.00001 in.

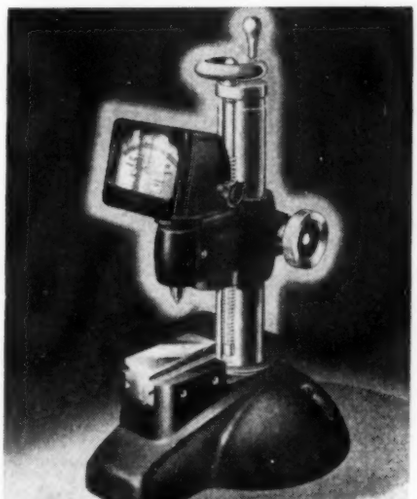
ELECTRONIC GAGE—*Yankee Precision Products Co., 50 Bartholomew Ave., Hartford 6, Conn.* An electronic snap gage for production inspection mounts the electronic gage head on snap frames. The unit can be mounted on a stand. Sizes up to 3 in. are standard.

MAGNETIC HARDNESS TESTER—*General Electric, West Lynn, Mass.* Simplifies inspection of parts too small to be production-tested with mechanical-type hardness testers. Tester consists of an alnico bar magnet set in an adjustable soft-iron frame, which permits the field strength to be set at the correct value for testing pieces between 1/16 and ½ in.

FLUX-DENSITY METER — *General Electric Meter and Instrument Div., Lynn, Mass.* Utilizing a moving-magnet rotor at the end of an exploring prod, this instrument permits flux to be measured at a single point in either air gap or iron structure.

X-RAY GAGING—*Sheffield Corp., Box 893, Dayton 1, Ohio.* Gaging instrument checks thickness of all types of moving materials without contact. Measuray, can be applied to almost any production process. Its accuracy is said to be better than one percent of material being checked if required. Utilizing an X-ray and electronic application, the Measuray compares the thickness of material with a sample of the same material.

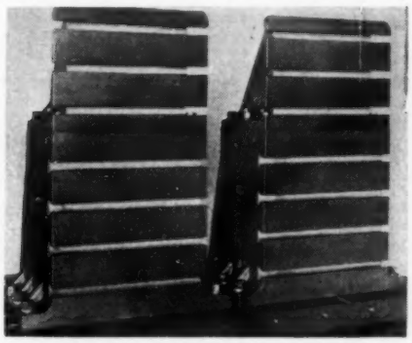
FIELD STRENGTH GAGE—*General Electric Co., Schenectady 5, N. Y.* A magnetic-field gage which indicates relative strength of the magnetic field in parts being examined for flaws by the magnetic-particle method of testing is useful for testing large castings and forgings. The gage permits standardized testing at fixed field intensities.



ELECTRONIC GAGES — *Jack & Heintz, Inc., Cleveland 1, Ohio.* Accuracy when used by inexperienced workmen is claimed for this line. Adaptable to special fixtures for precision production inspection, gaging parts for selective assembly, and other applications requiring graduations from 0.0001 to 0.00001 in. or 0.000005 in.

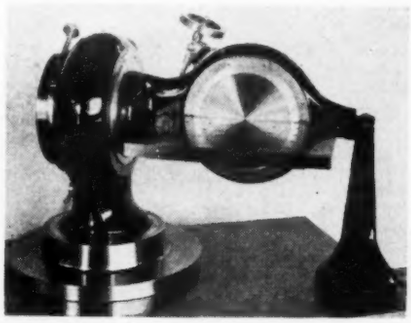
STRAIN GAGE AMPLIFIER—*G. C. Wilson & Co., 2 N. Passaic Ave., Chatham, N. J.* 25,000 amplifications from 1 to 30 cycles is provided by this unit. Used with a strain gage and cathode ray oscilloscope, it will provide a visual indication of vibration amplitude of 0.00001 in.

ANGULAR STRAIGHT EDGE—*Machine Products Corp., Detroit, Mich.* Angular straight edge is made of heat-treated Meehanite in any size from 18 to 84 in. in length, with any angle desired. Two faces of the straight edge are hand scraped. It can be used with or without handles at each end.

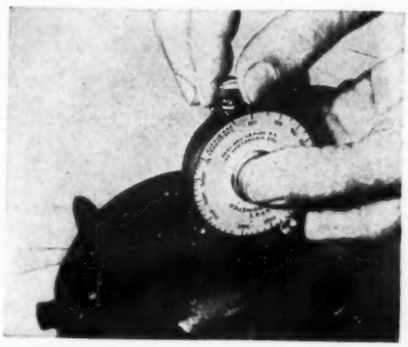


MATCHED ANGLE BLOCKS—*DeVlieg Machine Co., 450 Fair Ave., Ferndale 20, Mich.* Matched angle blocks which can be combined for accurately locating and chucking work are machined from box section castings with T-slots and flat surfaces in precise alignment.

SURFACE PLATES—*The DoAll Co., 1301 Washington Ave., S., Minneapolis 4, Minn.* With a working area 14x24 in. this surface plate is made of a specially alloyed close-grain iron. Underside of the overhang is machined so work can be clamped to the plate. Edge is tapped on 2-in. centers.

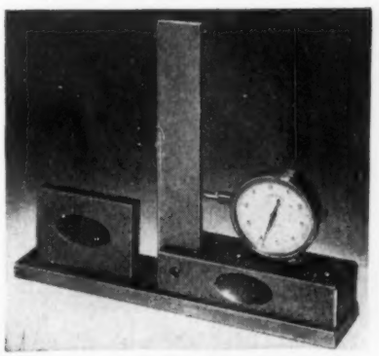


ANGLE COMPUTER—*Angle Computer Co., 1709 Standard Ave., Glendale, Calif.* For layout and inspection work the Model "G" Studler Computer has a 9x10 in. surface plate. The plate may be rotated 360° in each of three separate directions, and located accurately to 0.001 in. or to 0° 1'.



VIBROMETER—*Vibroscope Co., 6 E. 39th St., New York 16, N. Y.* This 5-oz. instrument, the Davey Reed Vibrometer, measures machine vibrations within the range of 450 to 50,000 cycles per min.

CLINOMETER — *Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.* Microptic Precision Clinometer optically checks angles over the full 360° circle to graduations of 0.050 min. The light alloy body contains an accurately divided glass circle and an optical reading system.

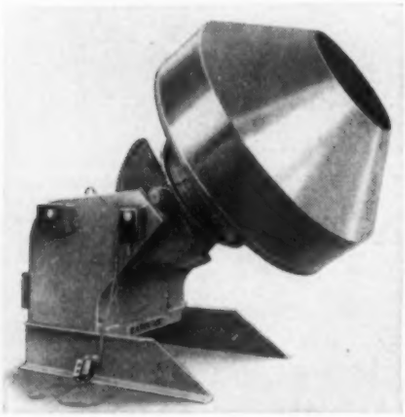


PRECISION SQUARE — *Acro Tool and Die Works, 4554 Broadway, Chicago 40, Ill.* Precision angle square, Micro-Sine, is designed to check right angles and accuracy of work to within 0.0001 in. within a given distance, a standard indicator shows the error on an indicator dial.

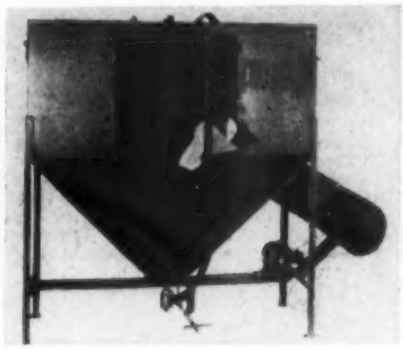
PROTRACTOR—*Interstate Sales Co., 1121 Broadway, New York 10, N. Y.* "Center finder" protractor with a magnesium frame weighs 10 oz. The retractable center-punch slides freely in the frame. One side of the tool has a double-reading degree scale, with two frame witness marks, allowing it to be used as a 360 deg. protractor.

PROTRACTOR — *Willey's Carbide Tool Co., 1340 W. Vernor Highway, Detroit 1, Mich.* A universal angle protractor which can be used on all carbide tool grinders provides a dual change of angles from 0 to 90°, permitting the grinding of two tools simultaneously at the same or different angles.

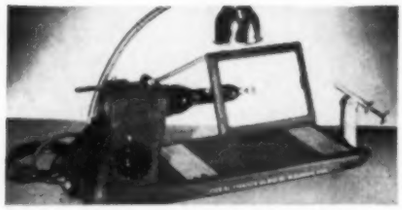
Cleaning and Finishing



PAN-TYPE MIXER — *Ransome Machinery Co., subsidiary of Worthington Pump and Machinery Corp., 1441 South Second St., Dunellen, N. J.* Rotating pan-type mixer is for tumbling, polishing, mixing, and other operations. The rotating pan is motor-tilted and motor-rotated at constant speed.

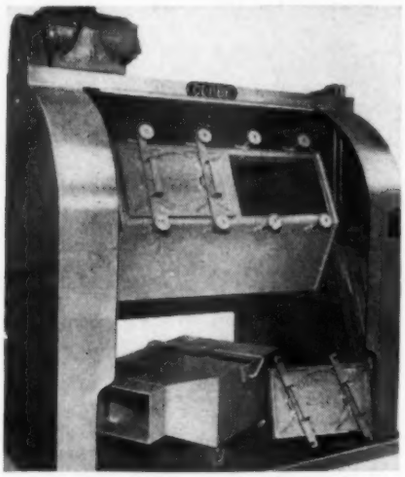


SANDBLASTING MACHINE—*Leiman Bros., Inc., 136 Christie St., Newark 5, N. J.* Sandblasting machine has been improved by the addition of a combination door and armholes with cuffs. The door is readily swung open for loading and removing work.



POLISHING LATHE—*Precise Products Co., 1328 Clark St., Racine, Wis.* Vari-Speed lathe operates at speeds up to 35,000 rpm. Built of a solid aluminum casting designed for full rigidity, compactness, and maximum access to operating area. Motor can be removed from the casting and used as a hand grinder.

ELECTROPOLISHING — *Rustless Iron & Steel Div., American Rolling Mill Co., 3400 E. Chase St., Baltimore, Md.* Solution suitable for polishing stainless steels by electrolytic methods. Parts to be polished are suspended in the electrolyte and anodically treated at low amperage, producing a bright surface finish and inhibiting corrosion.



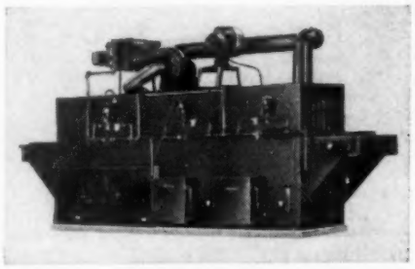
DEBURRING MACHINES — *Globe Stamping Div., Hupp Motor Car Corp., Cleveland, Ohio.* Burr-Rite machine features double and triple compartments which can perform two operations, polishing and deburring, simultaneously.

TUNGSTEN-CARBIDE BALLS — *Industrial Tectonics, Ann Arbor, Mich.* Precision balls made of tungsten carbide for use in burnishing and polishing operations. Their hardness in combination with corrosion resistance, makes them useful for check valves and other applications.

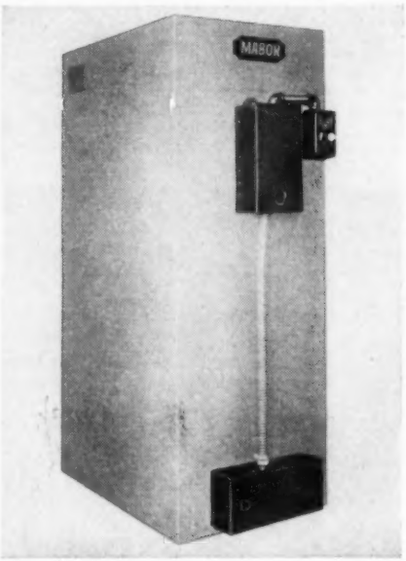
DEGREASING UNIT—*Detrex Corp., 14331 Woodrow Wilson, Detroit 32, Mich.* A conveyorized one-dip concentrator of compact design, the 1- DC-750, for degreasing small screw machine parts occupies less than 75 sq. ft. of floor space and measures 9 ft. 9 in. in height. Rotary baskets 10 in. in diameter and 20-in. long are used to carry the work.

DEGREASERS—*Optimus Equipment Co., 151 Church St., Matawan, N. J.* A complete line of metal-parts degreasers in standard and special models embody a varied number of cleaning cycles, including vapor, vapor-spray, liquid- liquid-vapor and liquid-vapor.

FINGERPRINT NEUTRALIZER—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.* Cosmoline fingerprint neutralizer provides protection for highly polished steel parts during production. The neutralizer has a water-displacing property which protects the part against rusting.



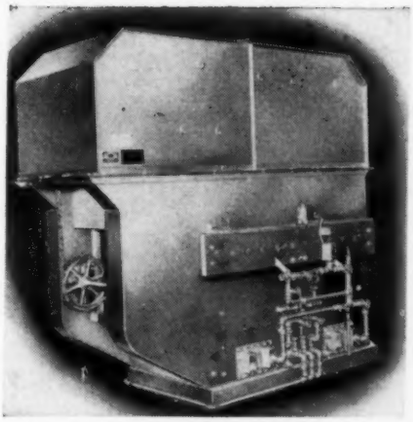
SPRAY WASHING MACHINE—*Optimus Equipment Co., 151 Church St., Matawan, N. J.* Flat-conveyor type, spray machine is adaptable for cleaning and other spray operations or for drying. Parts to be cleaned can be laid on the conveyor or handled in baskets or on racks.



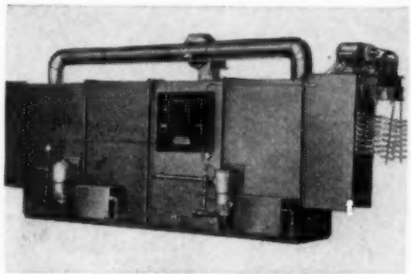
PORTABLE DEGREASER — *Mabor Co., Clark Township, Rahway, N. J.* Vapor degreaser is completely self-contained and can be used as a portable unit. The unit can be equipped with casters and requires only a plug into a power source to start its operation.

DEGREASING MACHINE — *Mabor Co., Walnut St., Clark Township, N. J.* Degreasing machine uses a liquid jacket heating system operating at atmospheric pressure. The degreaser is equipped with an automatic control system that preheats the circulating water above the dew point.

DIP-AGITATING MACHINE—*Mabor Co., Box 77, Route 3, Rahway, N. J.* Dip-agitating machine has the drive mechanism mounted in a removable frame. The weight of the parts is balanced by means of a knee which rests next to the bottom of the equipment, outside the tank.



DEGREASER—*Detrex Corp., Detroit 27, Mich.* Two-dip immersion vapor degreaser for cleaning small parts. Parts are placed in baskets which are loaded at one end of the degreaser, carried through the cleaning cycle, returned to the same end for unloading. Up to 180 baskets of parts are cleaned per hour.



WASHING MACHINE — *Optimus Equipment Co., 151 Church St., Matawan, N. J.* A continuous-type washing machine handles large numbers of metal parts on racks provided they are free-draining and the sprays have free access to the parts. A number of manifolds with spraying nozzles are mounted on all sides of the washing chamber. Can be furnished built of acid-proof material.

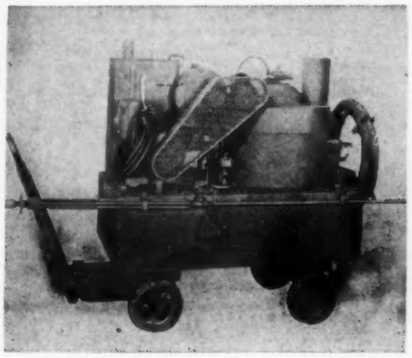
SOLVENT—*Oakite Products Inc., 22 Thames St., New York 6, N. Y.* A self-emulsifying, water-miscible solvent, Composition No. 98, is used to remove light shop dirt and non-pigmented stamping compounds from steel and aluminum. It is for use in pressure-spray washing machines.

STEAM-CLEANING POWDER—*Oakite Products, Inc., 24 Thames St., New York 6, N. Y.* Composition No. 92 is said to give thorough and fast steam-cleaning action at low concentrations, to prevent scale clog in steam coils, to have free-rinsing action on all surfaces, and not to possess offensive fumes or toxic vapors.

ALKALI CLEANER—*Enthone, Inc., 442 Elm Street, New Haven, Conn.* An alkali cleaner, Enthone Brass Cleaner, is said to have high detergent ability without tarnishing action on active metals including copper, brass, bronze, nickel silver, tin, and lead.

HOT-TANK CLEANER—*Turco Products, Inc., 6135 South Central Ave., Los Angeles, Calif.* Hot-tank cleaner is said to effectively remove carbon and paint, as well as grime, grease, gums, heat-hardened resins and heavy dirt, from steel and other metals. Known as Ferrex, the material uses a water solution and a hot tank.

VAPOR CLEANING UNIT—*Oakite Products, Inc., 26 Thames St., New York 6, N. Y.* Oakite-Vapor cleaning unit consists of an oil-fired steam generator which delivers vaporized cleaning solutions under pressures up to 200 psi. The unit can be operated on No. 1, 2, or 3 fuel oil, kerosene, or gasoline.



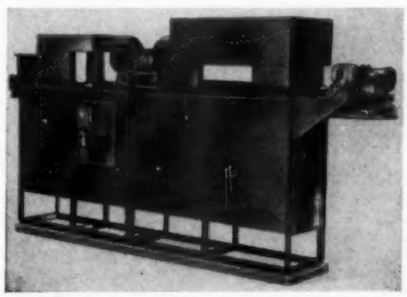
STEAM GENERATOR—*Oakite Products, Inc., 24 Thames St., New York 6, N. Y.* Delivers hot vaporized cleaning solutions under pressures up to 200 pounds for removal of grease and other deposits from surfaces. No. 1, No. 2, or No. 3 fuel oil, kerosene, or gasoline may be used to operate the unit.

HAND BLOWER—*Breuer Electric Mfg. Co., 5084 N. Ravenswood Ave., Chicago 40, Ill.* A small hand blower, Model 46, is said to have a balanced fan design which provides greater air displacement. The unit is equipped with a 1/3-hp. universal motor with sealed ball bearing.

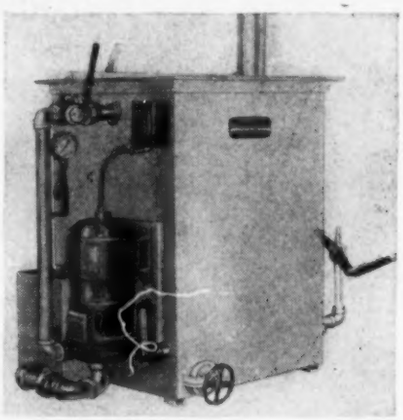
DEGREASING MATERIAL — *Kelite Products, Inc., Los Angeles, Calif.* Decarbonizing and degreasing material is said to soften carbon deposits so they can be wiped off with a cloth. The product is safe on all metals, is odorless, has no flash point, and will not burn or explode.

EMULSIFYING DEGREASER—*Gaybex Corp., Box 3-B, Nutley 10, N. J.* G-Bex D. is a neutral emulsifying solvent having a minimum flash point of 165° F. It will not strip paint or lacquer and may be used for light- or heavy-duty degreasing.

FLOOR CLEANER—*Optimus Detergents Co., 151 Church St., Matawan, N. J.* No. 1F10 is compounded for use on cement, terazzo or tile floors. Removes oil, grease and other dirts from the surface.



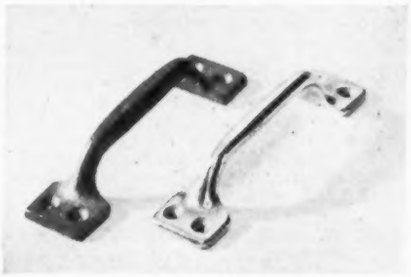
DRYER—*Optimus Equipment Co., 151 Church St., Matawan, N. J.* A cold and hot air dryer, designed to continuously dry loaded racks before and after plater- or water-solution dips. Fumes are drawn off the dryer by an exhaust blower. Steam, gas or electricity may be used and drying takes from 4 to 6 min.



SPRAY-TYPE WASHER — *Optimus Equipment Co., 151 Church St., Matawan, N. J.* Spray-type washing machine for handling parts on racks can be placed directly on the floor in which position the top of the unit is at working height. Adjustable spray nozzles are actuated by a lever-operated valve.

SPRAY-TYPE WASHER—*Industrial Products Sales Division of The B. F. Goodrich Co., Akron, Ohio.* Spray-type machine for continuous pickling and washing of metal parts is individually designed to meet requirements and lined with acid-resistant rubber.

CLEANING COMPOUNDS—*Pennsylvania Salt Mfg. Co., Philadelphia, Pa.* Pennsalt Cleaner A-22 is a general purpose soak-tank cleaner for aluminum alloys. Pennsalt PM-95 is a cleaning and descaling compound with additional agents.



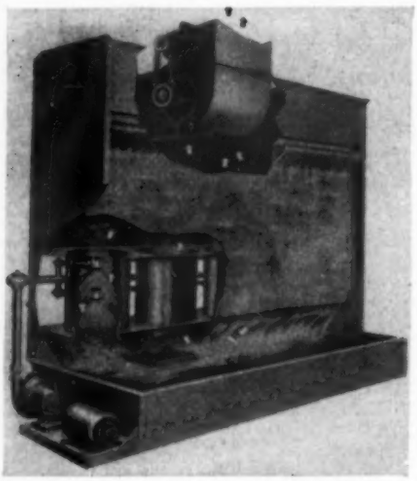
FINISHING—*The Sturgis Products Co., Sturgis, Mich.* A mechanical finishing process for small parts known as Britehoning is one of the Roto-Finish processes. It is basically a tumbling method involving the use of mineral chips and suitable compounds for developing a fine semi-lustrous finish on many types of metal parts.

HOT OXIDE DIP—*Mitchell-Bradford Chemical Co., Bridgeport, Conn.* Giving gages a hot, black oxide dip, gives them a rich lustrous black finish that does not change them dimensionally, but protects them from rust due to atmospheric moisture or perspiration.

CORROSION-RESISTANT COATING —*Rheem Research Products, Inc., 1409 Standard Oil Bldg., Baltimore 2, Md.* Iridite Bright forms a new corrosion-resistant finish on zinc- or cadmium-plated parts which is said to reduce finger-marking and not to fade or tarnish.

PROTECTIVE OIL—*Oakite Products, Inc., 24 Thames St., New York 6, N. Y.* Protection from rust on ferrous surfaces between operations is provided by a special protective oil, which imparts a thin, transparent coating that does not interfere with accurate gaging or discolor the surfaces. Parts may be immersed dry or wet.

CLEANING AND FINISHING



SPRAY BOOTH — *Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich.* Water-tube spray booth which is shipped 90% assembled, is a water-curtain type with a series of tubes, each of which contain two high-velocity, clog-proof nozzles to wash the air. The air is then drawn by suction through moisture separators and discharged.

PAINT-BOOTH COATING — *DuBois Co., Cincinnati 3, Ohio.* "Filmite," forms a tough skin over a non-hardening base which catches and holds the overspray. The material with adhering overspray is peeled off the walls. The material is water soluble and can be washed off if desired.

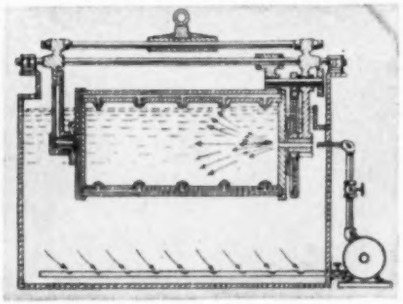
SPRAY BOOTH COATING—*Detrex Corp., Detroit 3, Mich.* A protective coating for spray booth side walls. Triad PR is applied to side walls of either wet or dry spray booths with brush or spray gun, and provides a light-reflective finish that withstands mild abrasion. This surface improves visibility in the booth and is easily flushed off with water or steam.

BAKING ENAMEL—*H. V. Walker Co., Elizabeth, N. J.* Applied by spray, roller-coating machine, or dip, Porciflex is baked at schedules from one minute at 450°, for sheet metal to 15 min. at 275° for other types of work. The enamel is said not to crack or flake when struck and not to peel off under normal conditions.

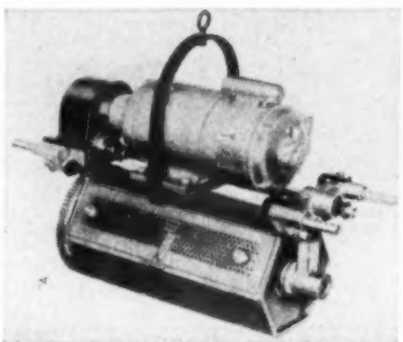
INDUSTRIAL ENAMEL — *E. I. DuPont de Nemours and Co., Inc., Wilmington, Del.* Auric Brown is chemically hydrated ferric oxide of small particle size. It offers increased resistance to light for industrial enamels, trim paints, coated papers and possibly plastics. Non-bleeding in the usual paint, enamel and lacquer finishes it also shows no tendency to chalk from outdoor exposure.

RACK COATING—*Michigan Chrome and Chemical Co., 6340 E. Jefferson Ave., Detroit 7, Mich.* Air-dry rack coating, Miccrotex, is a thermo-plastic insulating material said to meet the requirements of all plating, anodizing, tannerizing, parkerizing, and bonderizing cycles. It is a black material with a high luster that may be dipped, brushed, or sprayed.

COBALT-NICKEL PLATING—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* The cobalt-nickel process needs no organic brightening agents, which are difficult to filter. Variations of the process that are available are (1) a soft deposit that is readily buffed to cover imperfections in the base metal, (2) a moderately hard deposit for plating on brass goods, and (3) a hard deposit with the whitest color and luster for optical goods, food machinery, and tools.



PLATING APPARATUS — *Hanson-Van Winkle-Munning, Matawan, N. J.* Mercil plating apparatus includes pumping equipment. Tests are said to have shown that where the plating apparatus has pumping equipment, the plating time is reduced. When working with cyanide solutions the amount of cyanide consumed is cut down and the carbonates in the bottom of the tank are reduced.

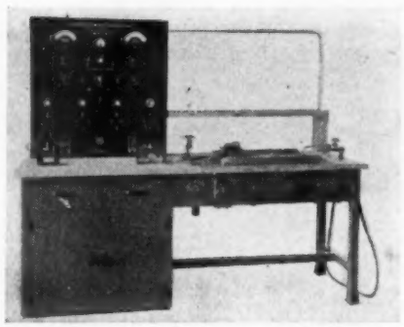


PORTABLE PLATING UNIT—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* A plating barrel development for small quantities of work, the Mercil Portable Barrel Unit, can be furnished with a steel cylinder for cleaning, a Monel cylinder for pickling, or a rubber or Bakelite cylinder for plating.

POROUS CHROME PLATING—*Van Der Horst Corp. of America, Olean, N .Y.* Method of "Porous-Krome" plating on aluminum produces thousands of tiny pores in each square inch of surface. These recesses serve as reservoirs to hold oil for lubrication. Use of the process is said to permit use of aluminum cylinders or liners, chromium plated for wear resistance.

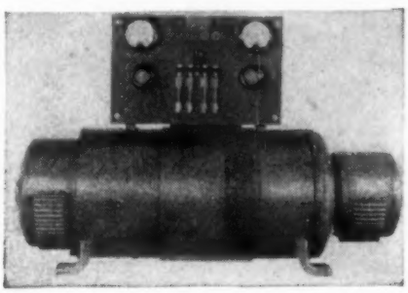
BRIGHT-ALLOY PLATING—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Bright-alloy plating material carries current better than gold and does not oxidize or tarnish as readily. The material (55% copper, 30% zinc, 15% tin) is silvery in appearance and can be soldered with a non-corrosive flux.

PAINT—*E. I. duPont de Nemours & Co., Wilmington 98, Del.* Duco finish is applied as before but has superior wearing and non-fading properties and a patina which makes it look from 1/16 to 1/8 in. deep, depending on how the light strikes it.



ELECTROPLATING CONTROL — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* The Diggin electroplating control table is a complete miniature plating laboratory for routine control of plating solutions or research. Test panels can be plated under closely controlled conditions.

ZINC PLATING—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* High-speed plating process that produces pure, unalloyed zinc deposits, which are highly protective and satin bright to bright in color. A modification of the bath permits zinc plating upon malleable and gray iron castings.



ELECTROPLATING GENERATORS —*Motor Generator Corp., Troy, Ohio.* Line of low-voltage electroplating generators. Six models range in size from 100 amp. at 6 volts to 2,000 amp. at 6 volts, or 1,000 amp. at 12 volts. The generator is equipped with interpoles or commutating poles which insure sparkless commutation. Special metallic brushes carry the high current.

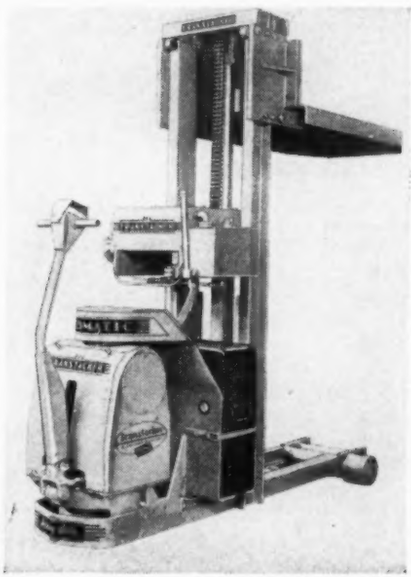
FILTER TANK—*Sparkler Manufacturing Co., Mundelein, Ill.* Model 8-18 plating solution filter, has been designed for bright nickel plating solutions. The tank is rubber lined.

Plant Service Equipment

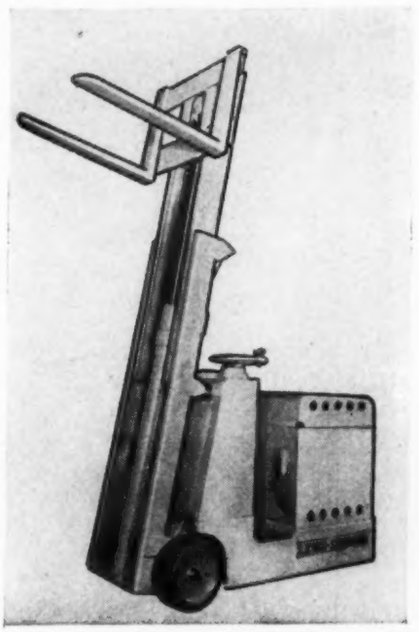
UNLOADER—*Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.* Attachment for lift truck is operated by the driver, from his regular position. Two double-acting hydraulic cylinders are used. It can be used to pull dies onto the forks from a die bed or rack.

FORK TRUCK—*Clark Tructractor, 1938 Ezra St., Battle Creek, Mich.* Designed to lift and tier unit loads weighing up to 1000 lb. and to operate within narrow limits. The Trucloader is suitable for loading and unloading highway trucks and trailers. It is maneuverable in narrow aisles and has a turning radius of 57 in.

LIFT TRUCK—*Barrett-Cravens Co., 3255 W. 30th St., Chicago 23, Ill.* Electrically operated lift-truck, the Power-Ox, has 4-in. vertical lift accomplished in 4 sec. with a hydraulic gear pump connected to the electric motor. The unit has two speeds forward and two in reverse. Can be turned with full power through 270°.



HIGH-LIFT UNIT—*Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* A battery-powered high-lift tiering unit, the Transtacker, is available in four models to handle all types of pallets and skid platforms. Overall height of the unit is 83 in. The platform model has a capacity of 4,000 lb., and the open-face pallet model, a capacity of 3,000. The straddle-type pallet model has a capacity of 4,000 lb. The extended load or "cantilever" pallet model has a capacity of 2,500 lb.

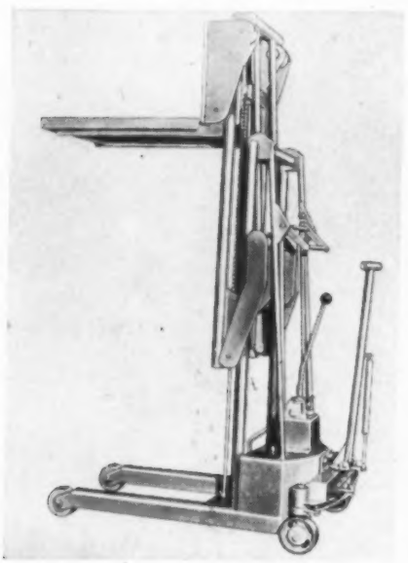


FORK TRUCK—*Lewis-Shepard Products, Inc., 222 Walnut St., Watertown 72, Mass.* 4000-lb. capacity electric fork truck has a limited length and short turning radius. Using a 48-in. fork and carrying a 48-in. load, the truck will enter an aisle 12-ft. wide and in one continuous forward travel of the truck, make a single right angle turn and stack

PLANT SERVICE EQUIPMENT—Industrial Trucks

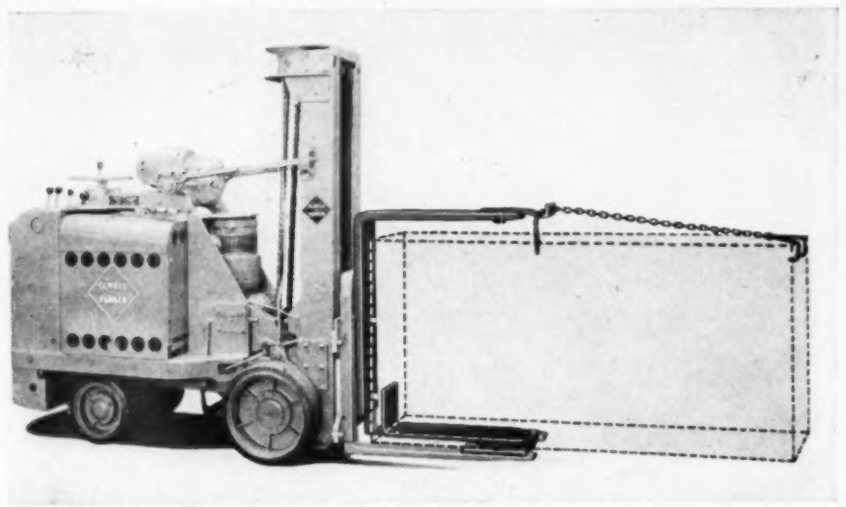
ALUMINUM WHEELS—*Aircraft Mechanics, Inc., Colorado Springs, Colo.* Cast-aluminum industrial wheels are mounted to solid-rubber or zero-pressure rubber tires. Wheels in sizes from 2 to 10 with load capacities ranging from 300 to 884 lb. are available.

BATTERY CHARGER—*Motor Generator Corp., Div. Hobart Bros. Co., Troy, Ohio.* Automatic motor-generator set for direct-current charging of batteries in industrial trucks charges either lead-acid or nickel-iron batteries. The generator is a 15-16 volt, dc. 50 amp., ¾ kw. diverter-pole type.

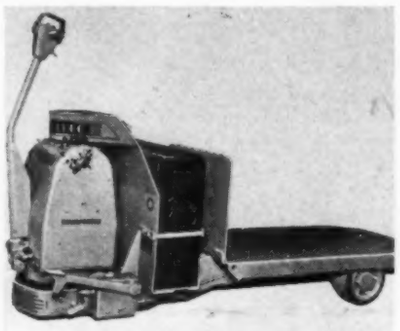


LIFT TRUCK—*Lyon-Raymond Corp., 2671 Madison St., Greene, N. Y.* A telescopic frame which adapts the High-Lift truck to higher stacking and tiering jobs increases the elevated height of the platform from 48 in. to 84 in. In lowered position the over-all height of 69 in. is maintained.

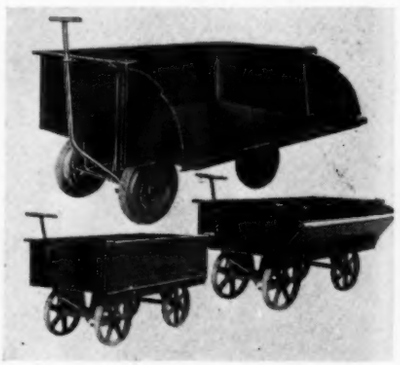
CLAMP TRUCK—*Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Light, bulky cartons are handled without pallet or skid by hydraulic pincers. The clamping pads are adjustable in height to suit the loads and are mounted on a scissors-type frame.



TRUCK ATTACHMENT—*The Elwell-Parker Electric Co., Cleveland, Ohio.* Boxes too long to be handled crosswise on fork trucks can be moved with this articulated carrier attachment. Small turntable bolted to the lower fork supports the load. Overhead fork is adjustable for height of load and has chains with hook clamps for outer end of load.

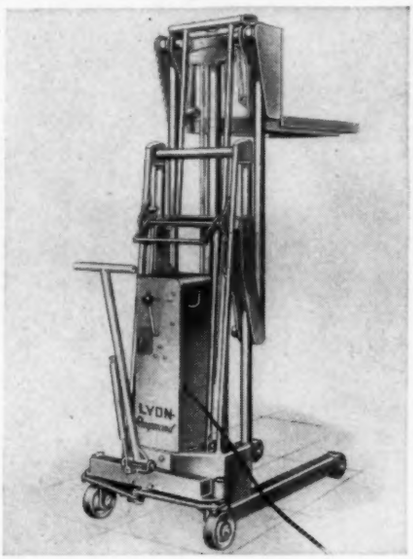


LIFT TRUCK—*Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Improvements in the Transporter include a new hydraulic life pump. A combination low-pressure cylinder for raising the platform into contact with the pallet and a high-pressure cylinder for raising the load are used. Brake is applied automatically by release of the guide handle.



HAND TRUCK—*Materials Handling Div., Market Forge Co., Garvey St., Everett 49, Mass.* The load Cart has 16-in. dia. pneumatic rubber tires making it easy to traverse poor floors or outdoor areas. The truck has an inside volume of 22½ cu. ft. and will take loads to approximately 1,000 lb.

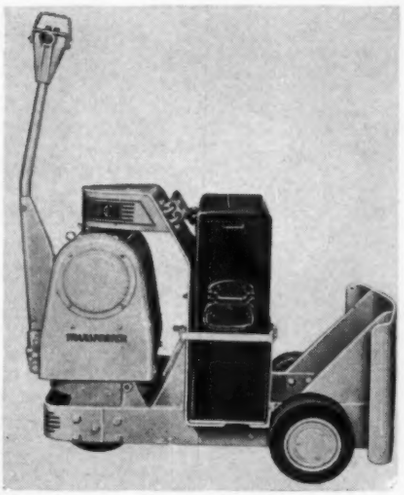
FORK TRUCK—*Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio.* A fork-lift power truck with an elevating reach of 18 ft. has a capacity of 4,000 lb. up to 11 ft. and 3,000 lb. to 18 ft. The upright columns may be tilted 15° backward and 5° forward.



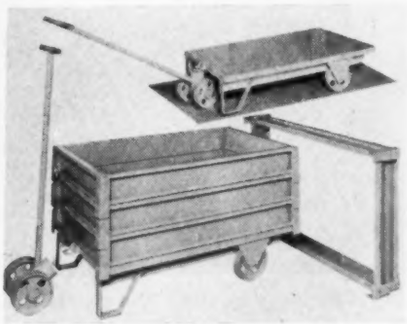
HYDRAULIC TRUCK UNIT—*Lyon-Raymond Corp., 2882 Madison St., Greene, N. Y.* A hydraulic power unit for installation on high-lift truck consists of electronic motor, hydraulic gear-type pump, valves, oil reservoir and controls. It is available with ½ or ¾ hp. motor.

LIFT TRUCK—*Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Fork truck with a lift of 130 in., Automatic Sky Lift, has collapsed height of 83 in. Controls include two pedals—brake and accelerator—steering wheel and two levers to control tilt and lift, and forward and reverse directions.

INDUSTRIAL TRUCK—*Salsbury Motor, Inc., Pomona, Calif.* Series of industrial trucks built around a "Turret" includes the Salsbury "Power-Package" which consists of a 6-hp. gasoline engine geared to a drive wheel through a fully automatic clutch and transmission. The turret can be turned to provide power in any direction. Fleet operators can have a spare turret which can be installed in a truck in less than 30 min.

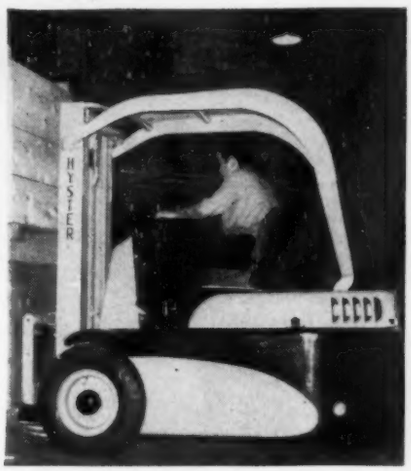


POWER UNIT—*Automatic Transportation Co., 101 W. 87 St., Chicago 20, Ill.* Transtractor, a power unit for pushing or pulling unpowered platform or pallet trucks has front-wheel drive for maneuverability. Forward and reverse controls are pushbutton operated from the guide handle. Raising and lowering the guide handle controls two forward and two reverse speeds.



SEMI-SKIDS AND JACKS—*Materials Handling Div., Market Forge Co., Everett, Mass.* The skids and side members are made entirely of steel, may be used with hand and powerlift trucks. A hook arrangment on the skid jack allows the load to be lifted more than 1 in.

DIE TABLE—*Service Caster and Truck Div. of Domestic Industries, Inc., 231 S. La Salle St., Chicago, Ill.* A combination die table and shop lifter, the "Liftable," has total lift of 14 in. Height of table top lowered is 28 in., raised 42 in. Size of the table top is 26x43 in.

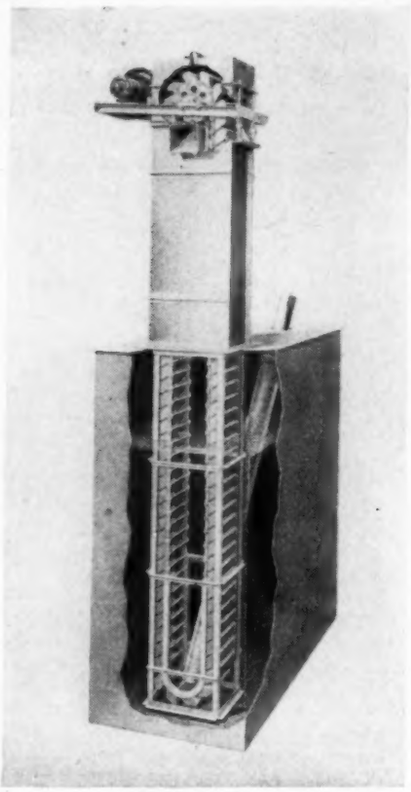


LIFT TRUCK—*Hyster Co., Portland 8, Oregon.* Pneumatic tires on this 4,000 lb., fork-type lift truck adapt it for use over indoor or outdoor road surfaces.

HAND TRUCK—*Magnelux Mfg. Co., 321 E. 4th St., Los Angeles 13, Calif.* A general purpose hand truck made of cast magnesium alloy weight 26.6 lb. The Zephyr is balanced so that when unloaded it automatically falls forward rather than backward.

PALLET TRUCK—*Moto-Truc Co., 6536 Carnegie Ave., Cleveland 3, Ohio.* Handles 2-, 4-, or 8-way pallets. Can be equipped with motor-driven pump, to lift the load, and 2-speed control. Forks are provided in lengths of 24 to 60 in., in widths of 22 to 27 in.

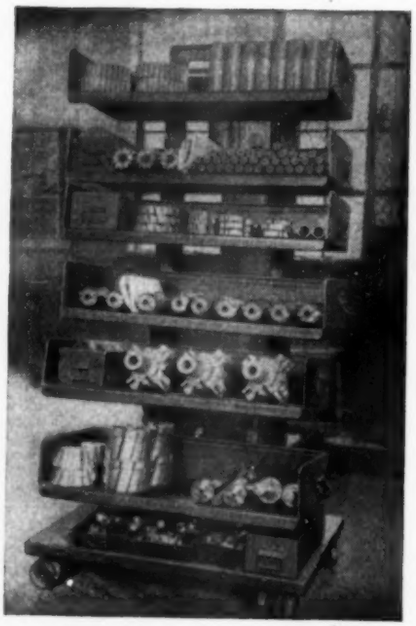
SPUR CURVE—*Rapids Standard Co., Inc., 308 Peoples National Bank Bldg., Grand Rapids 2, Mich.* Main line wheels on this conveyor are independently mounted. Their position is determined by levers which raise and lower the switchplate. With switch in the up position, movement is along the main line, with the plate lowered, parts are diverted around the curve.



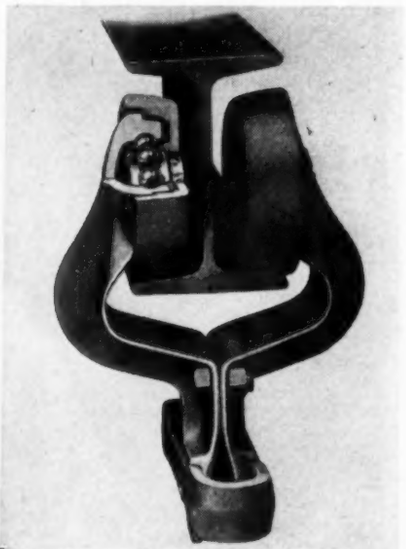
BUCKET ELEVATOR—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.* An internally loaded, loop-type bucket elevator, the "Interno," is suited to gently handling delicate, manufactured parts. An endless series of overlapping, inwardly-opening continuous buckets supported by a steel roller chain operates over sprocket wheels at the top of the lift. The elevator can be loaded on both sides and can be discharged at the top to either side.

CABLE-LIFT DEVICE — *Rapids-Standard Co., Inc., Grand Rapids 2, Mich.* Stevedore, Jr. portable power belt conveyors now have a cable-lift device for elevating the head end. Adjustment is made by turning the lifting handle. The accessory can be added to units already in use.

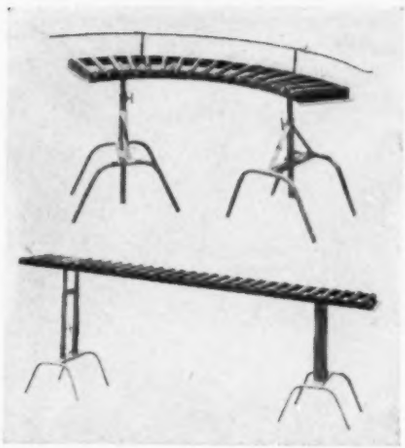
CONVEYOR—*Standard Conveyor Co., North St. Paul 9, Minn.* An all-purpose portable belt conveyor for carrying bags, boxes, crates, cartons, and other commodities, is adjustable to inclined, declined, or horizontal positions.



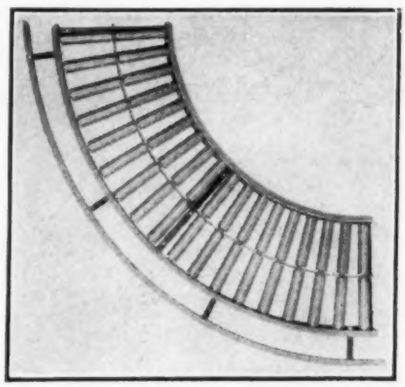
RACK-CONVEYOR—*The Rack Engineering Co., Butler St., Pittsburgh, Pa.* The Master-Trays hung on this conveyor can be varied to suit the height of material handled. The conveyor has 12 roller-bearing steel wheels with a swivel arrangement to provide maneuverability. Each tray will handle 300 lb.



CONVEYOR TROLLEY — *Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.* The wheel forms the inner bearing race and the one-piece bracket forms the outer race. With this arrangement, it is the inner, rather than the outer, race which revolves. Wear is equally distributed on the inner race, and all fixed points of pressure are on the outer race where the larger diameter provides a greater area of distribution.



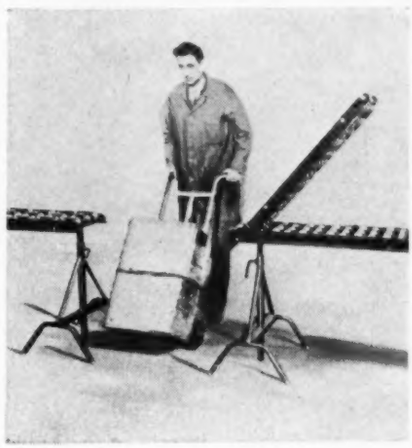
CONVEYOR—*Island Equipment Corp., 101 Park Ave., New York 17, N. Y.* Gravity conveyor for light-weight operation is supplied with a choice of single or double post leg supports which are adjustable to desired height.



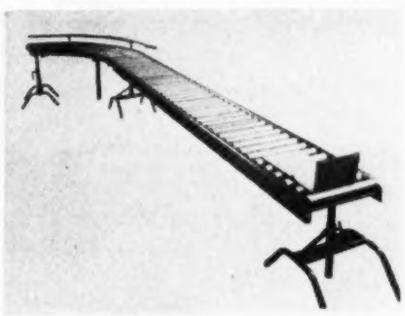
GRAVITY ROLLER CONVEYOR—*Lyon Metal Products, Inc., Slarck St., Aurora, Ill.* Gravity roller conveyors in these sizes: three straight sections, all 10 ft. long and in three widths, 12, 18 and 24 in.; three 90° curved sections, 12, 18 and 24 in. wide, and two trestles 18 and 24 in. wide.

PORTABLE CONVEYOR — *Metzgar Co., Grand Rapids, Mich.* Portable conveyor unit, the "Power Helper," has a power-driven belt with speed variable from 40 to 50 ft. per min. It is adjustable from a horizontal position, where it is 18 in. high, to a 45° pitch.

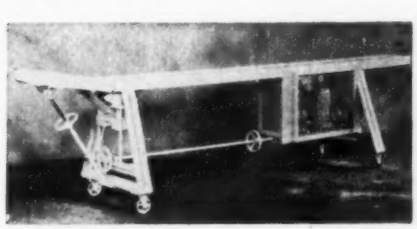
HEAT-TREATING CONVEYOR — *A. F. Holden Co., New Haven, Conn.* A simplified system of automatic conveyors for production heat-treatment can be used for conventional heat-treating, austempering, martempering, flow heat-treatment, liquid carburizing, and cycle-annealing. Transfer units are structurally separate and independent from the horizontal transport conveyor, and can be installed at any point. The horizontal conveyor can be made in separate sections to fit each step in the process.



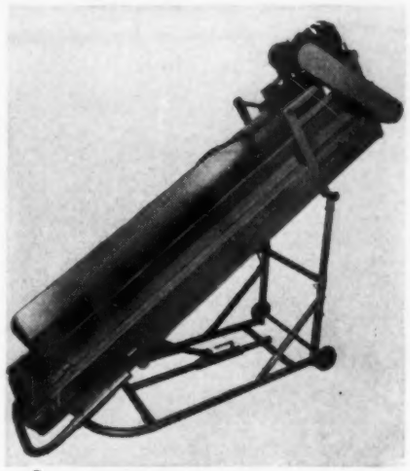
HINGED CONVEYOR—*The Rapids-Standard Co., Inc., Grand Rapids 2, Mich.* Hinged conveyor section to use in bridging aisle-ways provides a 36-in. open passageway. The hinged section is made as part of a standard 10-ft. section.



GRAVITY CONVEYOR — *Rapids Standard Co., 308 Peoples National Bank Bldg., Grand Rapids 2, Mich.* "Rapid-Roller" gravity conveyor is intended for medium-duty use when materials have insufficient flat area for wheel-type conveyors. The frames are made in 12 and 18 in. widths and 5 and 10 ft. lengths. Standard supports are used.

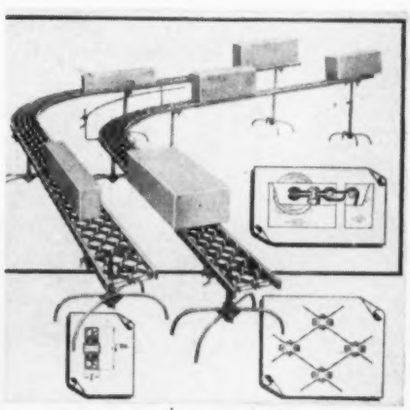


CONVEYOR—*Island Equipment Corp., 101 Park Ave., New York 17, N. Y.* Conveyor is designed to carry material from extruders, permitting it to cool for safe handling. Control handwheels adjust the height of the infeed section to the outlet of the extruder and control the speed of the belt.



PORTABLE BELT CONVEYOR — *Rapids-Standard Co., Inc., 440 Peoples National Bank Bldg., Grand Rapids 2, Mich.* A portable, power-driven, endless belt conveyor intended to withstand the abuse of pressroom operation is readily adjustable at both delivery and receiving ends. The 6-ft. model is adjustable up to 39° operating pitch and has 12- and 16-in. belts. The 8-ft. model is adjustable up to 44° operating pitch with the same belt sizes.

JACK-KNIFE CONVEYOR—*Island Equipment Corp., 101 Park Ave., New York 17, N. Y.* Legs of this gravity conveyor can be raised or lowered from 6 to 52 in. height by loosening two wing bolts. Permits compact storage.

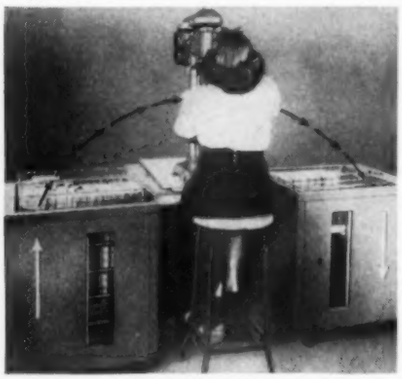


PORTABLE CONVEYOR — *Market Forge Co., Everett 49, Mass.* Each 10-ft. length weighs 58 lb. in steel. The sections are reversible with one side used for moving large packages, and the other for small packages with the side members acting as guide rails. The units are made in steel, aluminum, or stainless steel.

PLANT SERVICE EQUIPMENT—Misc. Materials Handling

CRANE CONTROL—*Control Division, General Electric Co., Schenectady 5, N. Y.* Pendant control for floor-operated cranes can be used on ac. or dc. with motors up to 15 hp. at 220 volts. The control weighs 8½ lb. and may be suspended from the trolley of the crane or hung at a distance.

SLIDING-FRONT HOPPER—*Stackbin Corporation, Providence, R. I.* Sliding-front hoppers regulate the flow of small parts in assembly bins. The slide is held in position by a wing nut and is easily adjusted.



MATERIAL RACKS—*American Machine & Foundry Co., 511 Fifth Ave., New York 17, N. Y.* Spring-powered racks automatically adjust the level of the material. The units are designed to handle parts of any weight. They are mounted on ball-bearing casters to permit movement from one machine to another.

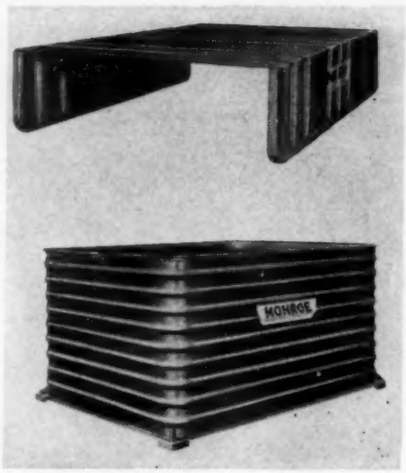
ASSEMBLY BINS—*Stackbin Corp., Providence, R. I.* Hopper for assembly bins increases the capacity of the bin four times. This equipment is made of heavy-gage sheet steel with welded construction.

STEEL RACKS—*Massey Machine Co., 800 Pearl St., Watertown, N. Y.* Welded-Steel racks for handling bar stock and similar items. Racks are made double as shown or in single style for stacking next to a wall.

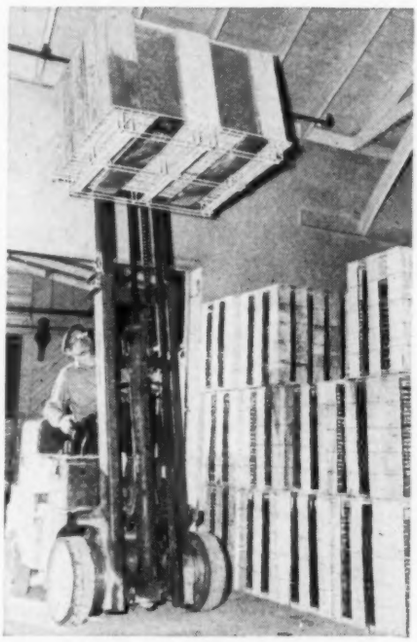
UTILITY HOIST—*Taylor Machine Co., 1917 E. 61 St., Cleveland 3, Ohio.* Small, crank-operated utility hoist weighing less than 40 lb. has housing, cover, and drums made of aluminum. Gear ratio of the hoist is 24 to 1, with a capacity of 2,000 lb.

CABLE REEL—*Appleton Electric Co., 1701-59 Wellington Ave., Chicago 13, Ill.* A reel for electric cable especially designed for use with traveling hoists. Type "YS" Reelite has no exposed current collectors, trolleys, or wires. The reel automatically takes up and pays out cable for any traveling electric hoist within its rated capacity.

PORTABLE CRANE — *Industrial Equipment Co., 315 N. Ada St., Chicago 7, Ill.* This gantry crane with 1-ton capacity is designed for ease in handling. The crane is said to have generous safety factor.



MATERIAL HANDLING — *Monroe Auto Equipment Co., Monroe, Mich.* The use of high-tensile steel results in substantial weight saving in line of material handling equipment. A 42x60x12-in. basic platform skid without runners weights 155 lb. in 11-gage high-tensile steel, compared with 234 lb. with the 7-gage hot-rolled steel previously used.

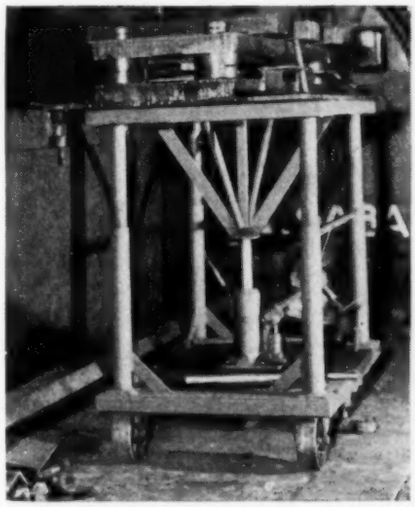


PALLET—*Union Steel Products Co., 445 Pine St., Albion, Mich.* 8-way wire pallet is made from steel wire. The pallets are accessible from any side or corner with a fork-lift truck.

EXPENDABLE PALLETS — *Techtmann Industries, 714 W. Wisconsin Ave., Milwaukee 1, Wis.* Lightweight pallets have a double corrugated top supported on wood blocks and dipped in a water-resistant adhesive. Said to be inexpensive enough to permit discarding after a single trip, they have carried a 4,000-lb. load.

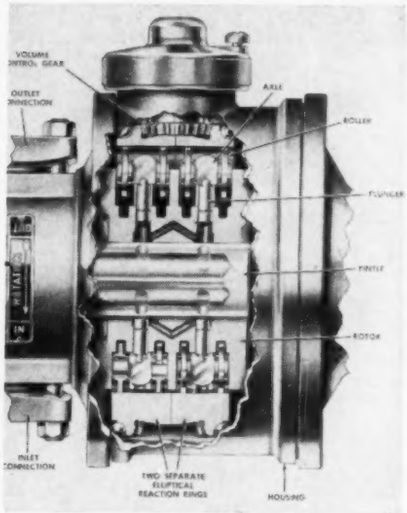
PALLET—*Lawrence Universal Pallet Corp., San Francisco, Calif.* The pallet measures 40 x 48 in. and is made of replaceable wooden components. Pallets will be delivered and redelivered to members of newly established pallet exchange in carload or truckload lots.

ELEVATING TABLE — *Lyon-Raymond Corp., 2775 Madison St., Greene, N. Y.* Telescopic cylinder developed for the hydraulic elevating table makes possible an elevating range from 28 to 50 in., lifting 22 in. The greater range of elevation permits leveling with press beds and storage racks in handling dies, jigs, and fixtures.

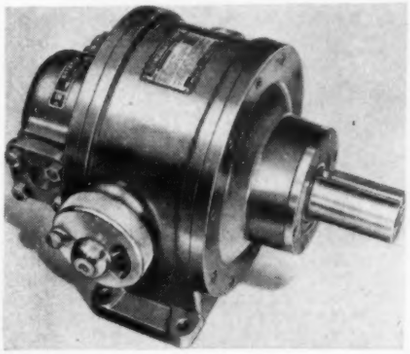


UTILITY TABLE—*Rack Engineering Co., 5102 Butler St., Pittsburgh 1, Pa.* Hydraulic utility table, Model No. 11067 is rated at 2,000 lb. capacity. The table is mounted on heavy-duty, roller-bearing casters. The load is raised by a pedal, leaving the operator's hand free during lifting.

FLUID MOTOR — *Denison Engineering Co., Columbus 16, Ohio.* A fluid motor for controlled variable speed where shock-loads present problems is available in a 3 or 5 hp. capacity, with or without a speed-control valve. A choice of geared-head units of various gear ratios and of brackets for mounting the motor in difficult positions is available.



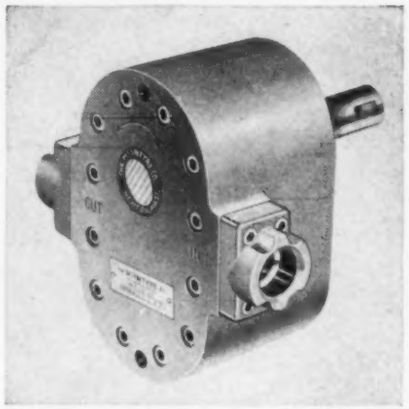
HYDRAULIC PUMPS — *Superdraulic Corp., 12825 Ford Road, Dearborn, Mich.* A compact pump capable of developing 5,000 psi, and 40 hp. delivers 0 to 17 gpm. at 1200 rpm. The Superdraulic is a radial-type plunger pump arranged so that centrifugal force maintains the plunger rollers in contact with an elliptical reaction ring.



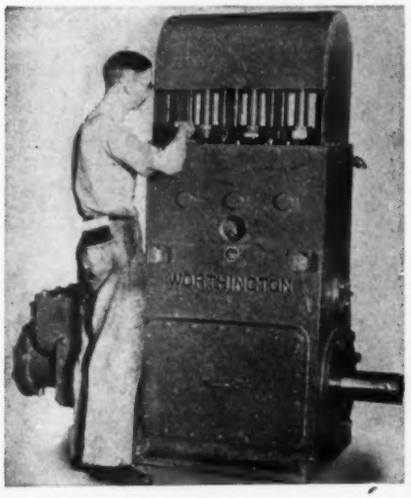
HYDRAULIC MOTOR—*Superdraulic Corporation, Dearborn, Mich.* Triport Motor is said to make direct drive available for many machines. The 47-hp. motor is only 10½ in. in dia. Torque range is as high as 200 lb.-ft. The motor is available in two types; one rated at 26½ gpm., with 3,500 psi. input at 1200 rpm.; the other at 19 gpm., with 5,000 psi. at 1200 rpm.

HIGH-PRESSURE PUMP — *McIntyre Co., 15 Riverdale Ave., Newton 58, Mass.* The Series 700 pump for high-pressure application in machine tools, material-handling equipment, etc., is a direct-drive, spur-gear pump, weighing 6 lb. The four models displace from 0.4 to 9.6 gpm., at speeds ranging up to 1750 rpm. against working pressures up to 1,000 psi.

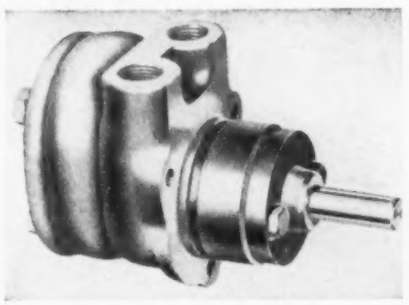
GEAR PUMP—*McIntyre Co., 15 Riverdale Ave., Newron 58, Mass.* Delivers from ½ to 3 gpm. (at 1750 rpm.) for continuous duty at pressures to 1000 psi. Series 100 pumps are of rotary spur gear design.



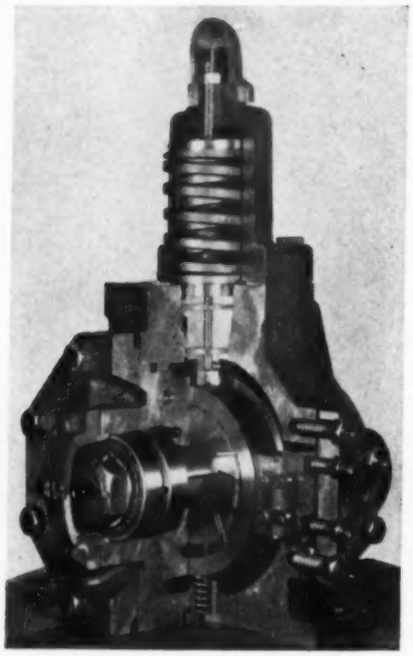
PUMPS—*McIntyre Co., 15 Riverdale Ave., Newton 58, Mass.* Designed for materials-handling equipment, machine tools and other applications, they are direct-drive, spur-gear pumps. The Series 600 hydraulic pumps for high-pressure applications have an average weight of 16 lb. Three models deliver 1.4 to 34.2 gpm., with power requirements ranging from 1 to 24 hp.



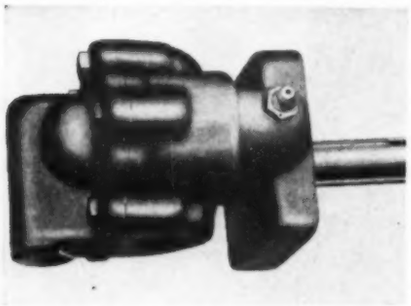
PUMP—*Worthington Pump and Machinery Corp., Harrison, N. J.* Improved variable-stroke triplex pump, Automatic Variflo, has the stuffing boxes on top of the cylinder where they can be packed and adjusted without difficulty. Stepless variation from 0 to 100% of capacity is possible through the control cylinder.



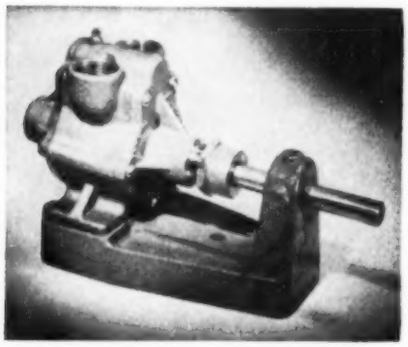
LUBRICATION PUMPS—*George T. Roper Corp., Rockford, Ill.* Series K rotary pumps for pressure lubrication and other purposes have capacities of ¾, 1½, and 3 gpm. Will operate in either direction at pressures up to 150 psi. with an operating speed of 1740 rpm.



VARIABLE-VOLUME PUMPS — *Racine Tool & Machine Co., Racine, Wis.* Models 2, 4, and 6 have rated capacities at 1200 rpm. of 12, 20, and 30 gpm. respectively. Delivery of the pump is varied by changing the relative position of pressure chamber ring and rotor to vary the displacement.



OIL PUMP—*Gray-Mills Corp., 1948 Ridge Ave., Evanston, Ill.* An All-Bronze gear pump for oils, solvents, and other liquids—corrosive or non-corrosive—which do not affect bronze. The GB series has a volume of 6 gpm. at 1750 rpm. Max. pressure is 300 psi.



PUMP—*ECO Engineering Co., 12 New York Ave., Newark, N. J.* A double-impeller gearless pump for circulation of water, light oil, and other liquids. The impellers are made of several layers of pressure-vulcanized, laminated material, and will pump in either direction.

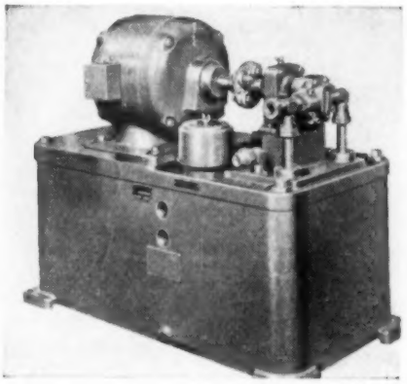
GEAR PUMP—*McIntyre Co., 15 Riverdale Ave., Newton 58, Mass.* A direct-drive gear pump for pressure lubrication of bearings, Series 1200, weighs 8 oz. and has a volumetric efficiency of 95%. Three standard models displace from 0.08 to 1.5 gpm. at speeds ranging from 1140 to 3450 rpm. and pressures up to 150 psi.

PUMP—*Ruthman Machinery Co., Cincinnati 2, Ohio.* Model 2-C ball bearing, motor-driven pump, Rumac, will handle 70 gpm. at a total head of 22 ft. when equipped with ¾ hp., 1725 rpm. motor. The pump can be installed either below or above the reservoir in a horizontal or vertical position.

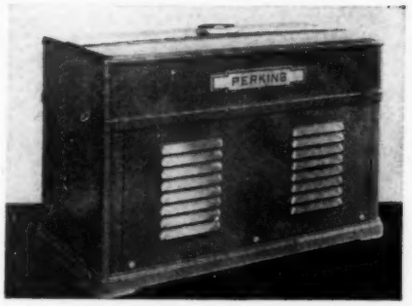
RECIRCULATING PUMP — *Dan Morey 814-16 S. Robertson Blvd., Los Angeles 35, Calif.* A recirculating pump for evaporative coolers, circulating coolants to machine tools or other uses, is 10 in. high with a shipping weight of 7 lb. It has a water output of 2 gpm. at 72-inch head.

PUMP—*John S. Barnes Corp., 301 S. Water St., Rockford, Ill.* Equalized Roto-Blade Pumps may be used for continuous working pressures to 1,000 psi, or intermittent pressures to 1,500 psi. Capacities range from 8.5 to 50 gpm. Varieties available include single pump, double pump, single pump with feed pump, double pump with feed pump, and single pump with gear pump.

PADDLE PUMP—*Jerome Simer Co., 422-BB Stinson Blvd., Minneapolis 13, Minn.* Small paddle pump will operate up to 1750 rpm. Size is said to be right for machine-tool coolant, or for portable units in pumping cleaning solvents. The only moving part is the elastic impeller.



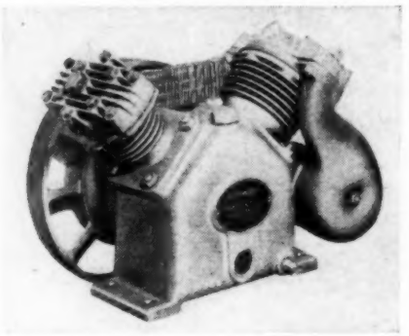
HYDRAULIC UNITS—*John S. Barnes Corp., Rockford, Ill.* Hydraulic units, F-10-A and F-20-A, have oil capacities of 9 and 27 gal. and pump deliveries of 5 and 12½ gpm. respectively.



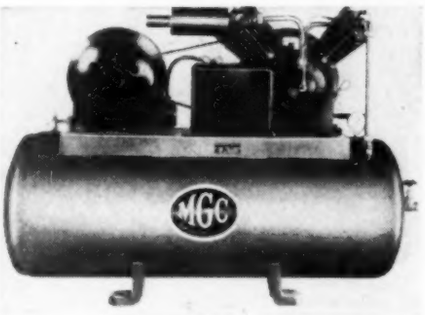
HYDRAULIC POWER UNITS—*B. F. Perkins & Son, Inc., Holyoke, Mass.* Series includes power units from .75 to 34 gpm., using pumps with 1000, 3000 and 10,000 psi. maximum pressure. The units are furnished with pump, motor, reservoir, filter, oil level gage, and adjustable pressure control valve.

PRECIPITATOR — *Raytheon Manufacturing Co., Waltham 54, Mass.* 1200 cfm. precipitator is said to remove 90% or more of contaminating particles from air. The unit will clean by recirculation the air in a room approximately 35 x 35 x 12 ft.

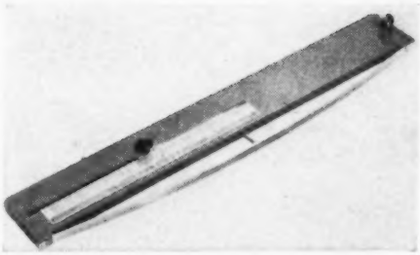
STATIC SEPARATOR — *Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio.* Moisture, oil, and scale are removed from compressed air by the Airfuge separator. Air delivered by the unit is 99% free of contamination. Made in three sizes for different capacities and pipe connection sizes.



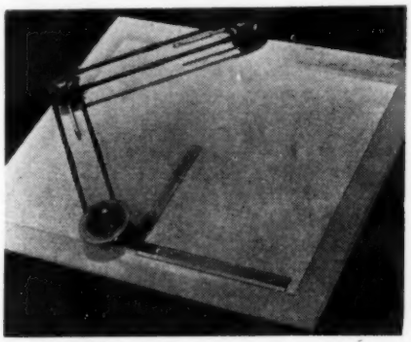
COMPRESSOR — *Worthington Pump and Machinery Corp., Harrison, N. J.* The Air King line of air compressors, designed for established motor horsepowers includes single-stage, and two-stage sizes for pressures up to 250 psi. and for mating to standard motors from 1 to 15 hp.



AIR COMPRESSORS—*Motor Generator Corp., Div. of Hobart Bros. Co., Troy, Ohio.* Super-duty, two-stage air compressors have 7, 9, 13 and 21 cu. ft. capacities. The 7 cu. ft. unit has a 60- or 80-gal. storage tank, and the other models have an 80-gal. storage tank.



ARCMETER—*Arcmeter Co., 1025 21st Ave., Rockford, Ill.* A unit designed to draw arcs of large radii for layout work where the projection method is used for checking. A flexible steel beam is adjusted to form an arc of the desired radius by moving the indicator knob. Any radius from 34.2 in. to infinity can be obtained.



DRAFTING MACHINE — *Universal Drafting Machine Co., Cleveland 14, Ohio.* Boardmaster drafting machine has all operating controls grouped in a small area for operation by the left hand. The basic unit can be used on horizontal, sloping, or vertical boards. Accessory units which are available are used.

WHITEPRINT MACHINE—*The C. F. Pease Co., Chicago, Ill.* Both revolving and sliding contact methods are available for making Whiteprints in the 88-R printing and developing machine. Produces prints in either cut sheets or rolls at a speed of 30 fpm.

PRINTING AND DEVELOPING UNITS—*Charles Bruning Co., 100 Reade St., New York, N. Y.* Model 41 combines individual printing and developing units in one cabinet. The printer has a printing speed up to 6 fpm., depending on the transparency of original. Printing width is 46 in.

FLUORESCENT UNITS — *Sylvania Electric Products, Inc., Salem, Mass.* Two design changes simplify maintenance. Commercial fixtures have the ballasts fastened to the top-housing with self-tapping "Z" screws which make it possible to remove the ballasts without removing the top housing. Double length industrial fixtures, Models HFF-208 and HFF-308, have the starters relocated at a center position.

LIGHTS—*General Electric Co., Nela Park, Cleveland, Ohio.* A complete line of fluorescent lamps is available in the 4500-white color. The color provides a balance between the present white and daylight colors. Lamps are available from 6- to 100-watt sizes.

SCALE MODELS—*Visual Production Planning, Inc., 101 Park Ave., New York, 17, N. Y.* Models for making three-dimensional layouts of factories have base cut to scale dimension of the machine under the maximum operating conditions. A die-cast identifying machine top is mounted on this base for easy recognition.

ALUMINUM PENCIL — *Elastichuck Sales Co., Inglewood, Calif.* Aluminum drafting pencil with a rubber collet to grip the lead. The rubber collet is the only contact between lead and pencil and is said to cushion it against undue pressure.

ALUMINUM DECIMAL CHART—*Enterprise Products Co., 15 1/2 South Van Buren Ave., Freeport, Ill.* An etched aluminum decimal chart, designed for attachment to standard types of drafting machines, is 3 x 5 in. and comes in two models to fit drafting machines using two parallel support bars and those with a single center bar.

DRAWING PAD—*Jiffy Sales Co., 1809 E. 37th St., Cleveland 14, Ohio.* Scale drawing pad can be used to make properly proportioned drawings in the shop without using drafting board or T-square. The Jiffy sketch pad contains 75 sheets of tracing tissue in a covered jacket which has four cardboard flaps. Different scales are printed on three of the flaps.

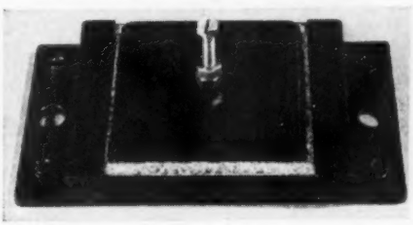
INDUSTRIAL APRON — *The B. F. Goodrich Co., Akron, Ohio.* Heavy duty, oilproof apron is made of Ameripol synthetic rubber, and measures 34 x 47 in. and weighs 1½ lb.

FACE SHIELD—*American Optical Co., Southbridge, Mass.* A face shield for over-all protection has window 18¾ x 10 in., of cellulose acetate 0.04 in. thick. The window extends completely around the face, covering the ears, and is attached to a fiber headguard.

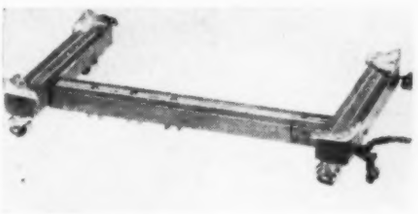
FLOORING—*Chemical Products Div., Goodyear Tire and Rubber Co., Akron, Ohio.* Griptred, a non-slip safety flooring, is a combination of abrasive aggregate and plastic binder. The abrasive aggregate is said to withstand crush loads in excess of 7,000 psi. The material can be applied by trowel, spray gun, or brush.

FLOOR MAINTENANCE UNIT—*G. H. Tennant Co., 2530 N. Second St., Minneapolis 11, Minn.* A floor machine with an overall height of less than 12 in. for polishing, scrubbing, steel wooling and other maintenance. The brush has bristles extending beyond the circumference of the disk and approximately 2 in. above the floor.

WORK TABLES—*Work-Flow Equipment Co., 207 Penn Ave., Pittsburgh 21, Pa.* A tilt-top table and a drafting table may be adjusted from 28¼ to 38¼ in. from a level position to any angle up to 20°. Adjustment is controlled by a small crank at the front of table.



VIBRATION DAMPER—*Finn & Co., 2850 8th Ave., New York 30, N. Y.* Type 1000 Unit Insulator is intended for heavy machinery. It has one or more Goodrich Vibro-Insulators inclosed in a welded-steel housing.



TOOL CHEST DOLLY—*Tool Chest Dolly Mfg. Co., 806 E. Fourth Place, Los Angeles 13, Calif.* An adjustable dolly suitable for use by machinists and maintenance men in moving heavy tool chests. Boxes from 7½x16½ to 14x26 in. can be carried. Designed to carry loads up to 75 lb., it weighs but 2¼ lb.

SAFETY LUNGS—*Mine Safety Appliances Co., Braddock & Thomas Sts., Pittsburgh, Pa.* Chemox breathing apparatus generates its own oxygen, giving the wearer one-hour protection in unbreathable air. Before canister is exhausted, a pre-set alarm bell rings a warning.

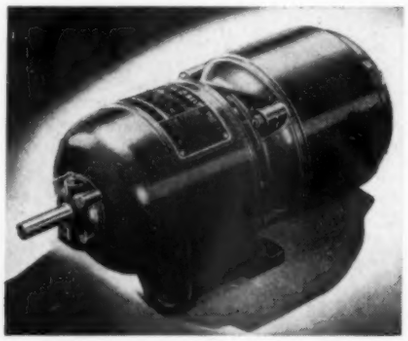
HEAT FAN—*Thermador Electrical Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.* An industrial version of the Thermador Electric Heat Fan can be used for heating in winter and circulating air in summer. The unit weighs 19½ lb. and is 19¼ in. high, 14¼ in. wide, and 18⅛ in. deep. The unit operates on 230 volts.

Parts and Materials

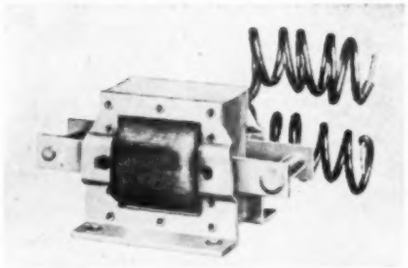
MOTORS — *Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.* Life-Line alternating-current motors more than 35% smaller than those they replace will be made in integral sizes from 1 to 300 hp. Completely redesigned, the new motor accomplishes the size reduction without loss of electrical properties. Starting torques have been increased as much as 134% and maximum torques as much as 116% per lb. of motor.

LIQUID-TIGHT CONDUIT—*Chicago Metal Hose Corp., Maywood, Ill.* Rex machine-tool conduit RT-25 is designed to the new machine tool electrical standards. The conduit has a galvanized-steel flexible metal hose liner and synthetic cover.

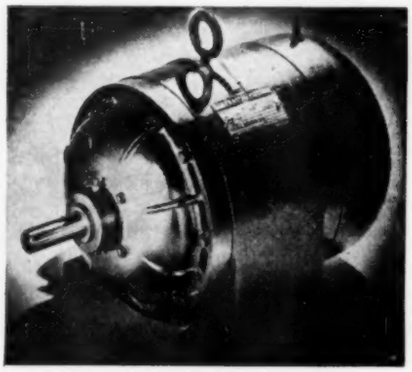
CONDUIT — *American Metal Hose Branch, The American Brass Co., Waterbury 88, Conn.* An electrical conduit for use on machine tools, developed to exclude moisture and oil from the electrical wiring. Sealtite conduit is made of a galvanized steel flexible tubing covered with an oil-proof synthetic material.



ELECTROFLUID DRIVE—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.* An Electrofluid Drive available in horsepowers up to 20 which consists of a general-purpose ac. induction motor, flange-mounted to a housing containing a hydraulic coupling. The fluid coupling is like those used in automobiles.



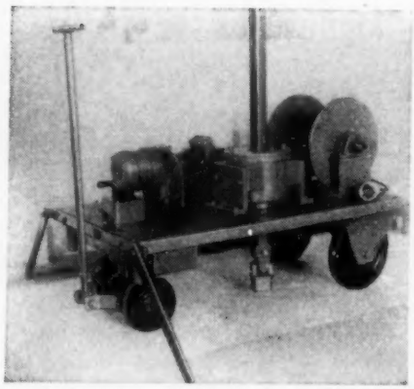
SOLENOID—*John S. Barnes Corp., Rockford, Ill.* Midget-Size Solenoid has a pull of 4 to 7 lb. by the plunger when it is extended between ¾ and 1⅛ in. When the plunger is seated, the hold-in pull is between 13 and 15 lb. The coils are treated so they will not be affected by oil or coolants.



TOTALLY INCLOSED MOTOR—*General Electric Co., Schenectady, N. Y.* A totally inclosed, fan-cooled motor, especially designed for use in extremely dusty, dirty, corrosive atmospheres added to the line of Tri-Clad induction motors. The motor is available in standard, explosion-proof, and dust-explosion-proof types from 1 to 1000 hp.

COMPACT MOTOR—*Transicoil Corp., 114 Worth St., New York, N. Y.* A compact, low-inertia motor for remote control application operates on 60-cycle, two-phase current and may be wound to operate from 10 to 80 volts or more. Designated as Model 2A Servo-Motor, it has practically constant impedance from full speed to stall.

MOTORS—*Lear, Inc., N. Ionia Ave., N.W., Grand Rapids, Mich.* VC. type motors are rated at 125 volts ac. or dc. and have an output of 1/100 hp. at 7500 rpm. The motors are non-reversing, with clock-wise rotation of the shaft at the fan end. The VD. motors are rated at 125 volt ac. or dc. and have an output of 1/30 hp. at 7500 rpm.



POWER TRUCK—*Payne Dean & Co., Madison, Conn.* Portable electric power unit can be used to apply power to existing hand-operated devices where comparatively slow speed and high torque are required. Standard speeds are 20, 40 and 60 rpm. for horizontal shafts, and 10 to 50 rpm. for vertical shafts.

SOLENOID RELAYS—*Allen-Bradley Co., 1311 S. First St., Milwaukee 4, Wis.* Line of universal-type solenoid relays in which a simple shift of connections permits changing normally open contacts to normally closed, or normally closed to normally open.

MAGNETIC STARTER—*Master Electric Co., 126 Davis Ave., Dayton 2, Ohio.* A single pushbutton is used for starting and stopping ac. across-the-line magnetic starter. Standard voltage ratings are 115 and 230 (dual voltage) for single phase, and 110, 208, 220, 440 and 550 for polyphase motors.

MAGNETIC RELAY — *Instrument Div., Thomas A. Edison, Inc., West Orange, N. J.* This relay is for operation on currents of thermocouple and photocell magnitudes or other uses requiring dependability under vibration.

LARGE SOLENOID STARTER — *Allen-Bradley Co., 1311 S. First St., Milwaukee, Wis.* The size 5 solenoid starter replaces the older size 5 clapper starter. Size has been reduced, with maximum horsepower rating of 100 hp., 220 volts and 200 hp., 440-550-600 volts.

MAGNETIC CONTACTORS — *Westinghouse Electric Corp., Pittsburgh 30, Pa.* Type M line of dc. single-pole magnetic contactors are available in rear- or front-connected units, with small or deep frames. Small-frame contactors are limited to 250 volts, deep-frame contactors are rated to 600 volts.

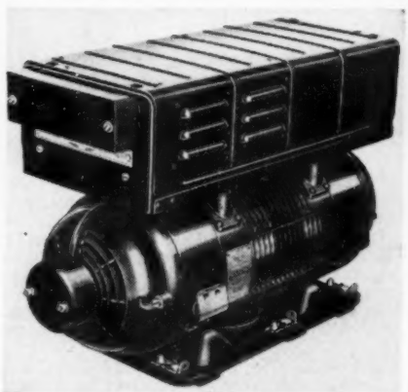
SOLENOID VALVE—*Johnson Corp., Three Rivers, Mich.* Direct-acting solenoid valve combines immediate full flow with the ability to operate under differential pressures as high as 150 lb. It will handle hot liquids or steam up to 365 F.

SOLENOID VALVE—*Allied Control Valve Co., South Norwalk, Conn.* A small solenoid valve to operate under high pressure weighs 1 lb. and requires a power consumption of no more than 10 watts. It will operate under pressures up to 150 psi.

TRANSFORMERS — *Meter and Instrument Div., General Electric Co., Schenectady 5, N. Y.* Two new current transformers for meter, relay, and control-device applications are designed for accurate metering over the normal current range. The JKL-3 is rated 5,000 volts and the JKL-4 is rated 8,700 volts.

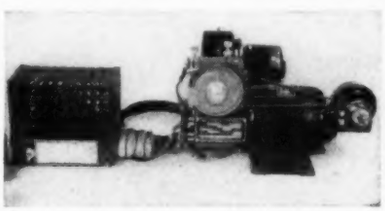
RELAY—*Westinghouse Electric Corp., Pittsburgh 30, Pa.* The single-break, normally closed main contacts and the double-break auxiliary contacts are suitable for carrying 5 amp. continuously, and for interrupting a dc. inductive coil lead of 150-va. maximum. Designed to provide magnetic overload protection on general-purpose and mill-motor applications and to prevent damage when load or cable jams.

VOLTAGE REGULATOR — *Sorenson & Co., Inc., Stamford, Conn.* Model D-500 ac. voltage regulator for general industrial application has a frequency range of 360 to 500 cycles, input voltage range 95 to 125, and output voltage range 110 to 120.



INVERTER — *Jack & Heintz Inc., Cleveland, Ohio.* This 2500-va. inverter provides a source of 400-cycle, 115-v. power. It is of the motor-generator, two-bearing type, complete with control box.

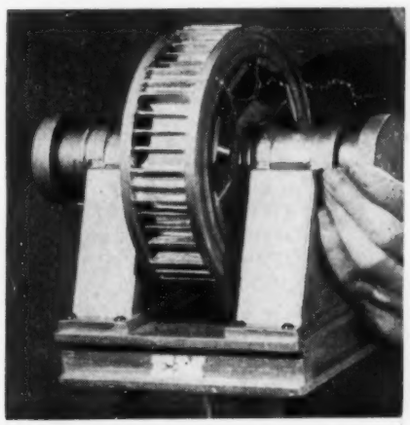
VARIABLE SPEED DRIVE — *Submarine Signal Co., 160 State St., Boston, Mass.* Servotron operates on ac., and through electronic controller, runs a dc. variable-speed motor. Maintains uniform torque over speed range.



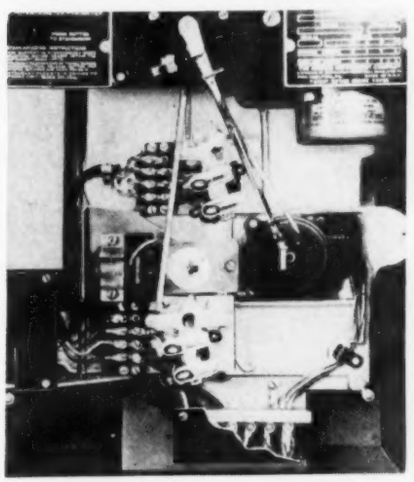
SERVOMECHANISM—*W. C. Robinette Co., 802 Fair Oaks Ave., South Pasadena, Calif.* Motron Servomechanism Model 61A is a continuous-balance control system of great sensitivity. Several miniature vacuum tubes directly control the speed and direction of a standard 1/15 hp. induction motor, according to the setting of the input dial, which may be rotated by forces such as electrical meter movements.

SERVO MECHANISM—*G. C. Wilson & Co., 2 N. Passaic Ave., Chatham, N. J.* Servo for remote indication or control consists of (left to right) torque unit, amplifier, and control. The system is sensitive to 1% changes in the control unit.

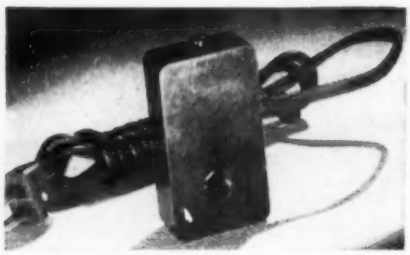
INSULATION STRIPPER — *General Cement Manufacturing Co., 919 Taylor Ave., Rockford, Ill.* Insulation can be stripped from wire of sizes 8 to 30 with the Speedex 733-K Stripper Kit. The stripping tool and seven interchangeable blades are packed in a small steel kit.



SPEED CONTROL—*Electric Machinery Mfg. Co., Minneapolis, Minn.* The drive is a self-contained electro-magnetic torque transmitter used with a constant speed ac. motor and an electronic controller. Built in ratings of 25 hp. and larger, at 1800 to 600 rpm.



ELECTRONIC DEVICES—*Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.* High quality control through continuous balance, rather than intermittent action, is a feature of these electronic control instruments. Front-set mercury switch circular chart controllers permit control of heat input simultaneously with changes in process temperature, practically eliminating instrument lag.



DEMAGNETIZER — *Grayhill, 1 N. Pulaski Rd., Chicago 24, Ill.* Tools with a diameter of 7/16 in., or less, are demagnetized in this unit. Operating on 115 volts ac., the unit can also be used to magnetize objects when desired.

SYNCHRONOUS CONTROL—*R. W. Cramer Co., Centerbrook, Conn.* A self-starting synchronous motor for application in the instrument and control field, the SX is compact in design, being 2⅜ x 2⅛ x 1½ in. in size. Torque is 30 in. oz. at 1 rpm.

REMOTE CONTROL UNIT—*Sperry Products, Inc., 1501 Willow Ave., Hoboken, N. J.* Miniature hydraulic remote control retains the advantages of larger units with only a single flexible copper tube connecting transmitter and receiver. Two units together weigh 3.7 lb. Either arm will move through an arc of 60°.

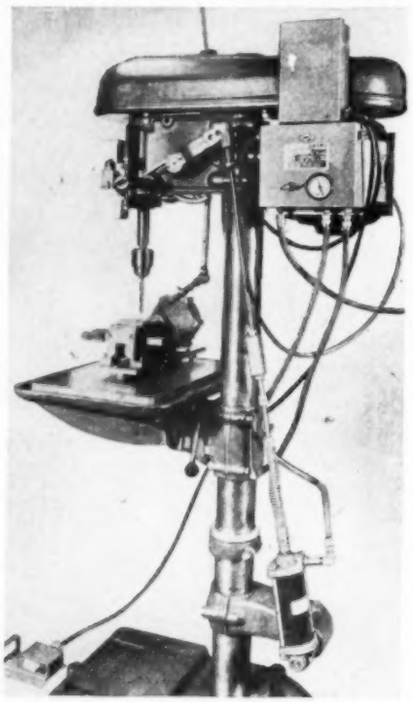
TUBE TESTER—*Radio Tube Division, Sylvania Electric Products, Inc., 500 Fifth Ave., New York 18, N. Y.* Counter type 139 and portable type 140 electron tube testers for industrial applications. Both instruments are rated at 20 watts.

PHOTOELECTRIC UNITS — *Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* Two photoelectric controls, Series 20 and 21, designed for general industrial and machinery application are designed for high-speed operation. The relay operates in 1/20 of a second. The operating range is 20 ft.

INDUCTION VOLTAGE REGULATORS — *Transformer Div., General Electric Co., Schenectady 5, N. Y.* An extended line of dry-type induction voltage regulators to include 300 and 600 volt-ampere ratings. Inductrols are available in a hand- or motor-operated design. Applications include the heat control of electric furnaces, and motor speed control.

ELECTRONIC TIMER—*Photoswitch Incorporated, 77 Broadway, Cambridge 42, Mass.* Four basic types of timing, interval, delayed action, automatic repeat and programming, and variations is provided in Type 30HL1 automatic timer. Any interval between 1/20th sec. and 4 min. may be timed.

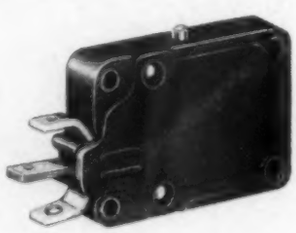
ELECTRONIC TIMER—*General Control Co., 1200 Soldiers Field Road, Boston 34, Mass.* Promatic electronic timer is said to give highly accurate control under virtually any condition of temperature and humidity. The timer allows either full automatic or semi-automatic control.



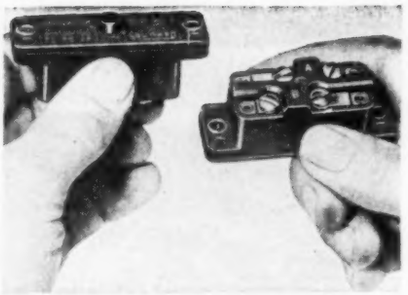
ELECTRO-AIR CONTROLS—*Electro-Air Devices Co., 2811 W. Fletcher St., Chicago 18, Ill.* The Electro-Air control may be used with any standard air cylinder, can be furnished to provide either single or multiple cycle control with the addition of cycle timing, hesitation limit switches, or other devices, for a variety of operations.

SWITCHES—*Micro Switch Div., First Industrial Corp., Freeport, Ill.* Twenty-four switches make up the "Die-Cast Enclosed Switch" line, furnished with a choice of: 4 actuator types, 3 circuit arrangements, and 2 mounting styles.

ELECTRIC SWITCH — *Mu-Switch Corp., Pequit St., Canton, Mass.* Actuated by changes in fluid pressure, this switch provides a means for regulating or indicating fluid pressures, or for controlling circuits operated by pressure changes of a liquid or gas.



SNAP SWITCH—*Acro Electric Co., 1321 Superior Ave., Cleveland 14, Ohio.* Model "M" rolling spring snap-action switch has a new molded case for greater strength. Size of barriers between the terminals has been increased. Heavier solder terminals are used with 0.082 in. terminal holes to make wiring easier.



PRECISION SNAP SWITCH—*Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* A precision snap switch for operating in a small space, with short movement and light pressure, Class 9007 Type A, is about 2½ x 1 x ⅞ in. in size, but is designed for 550-volt ratings.

MERCURY SWITCH — *Mercontrol, Inc., 278 Pearl St., New York 7, N. Y.* A mercury switch for remote control and automatic machinery, type D-100, has a full-load rating of 100 amp., at which it is said to operate only 25 C above the temperature of the surrounding air.

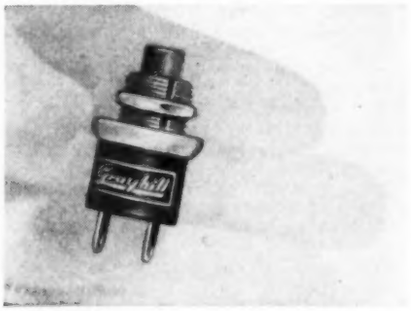
SWITCHES AND INDICATORS—*Control Division, General Electric Co., Schenectady, N. Y.* Oiltight push-button units, selector switches, and indicating lights designed for use on machine tools have a diaphragm seal and rubber gasket.

SWITCH—*Acro Electric Co., 1321 Superior Ave., Cleveland 14, Ohio.* Model M open-blade snap switch for vertical mounting has unusual compactness for multiple use.

OILTIGHT PLUGGING SWITCHES—*Control Div., General Electric Co., Schenectady, N. Y.* A line of oiltight, dustproof plugging switches for flange and surface mounting is designed to remove plugging power from a motor at the correct moment, to keep the motor from restarting in the reverse direction.

LIMIT SWITCH—*General Electric Co., Schenectady 5, N. Y.* A small oilproof, track-type switch for machine tool and similar applications, has interchangeable operating heads to permit roller-lever, roller-push-rod, push-rod, or plunger operation of the switches.

SWITCH—*General Control Co., 1200 Soldiers Field Road, Boston 34, Mass.* Five-position cam-lever switch has single-hole mounting of the frame to panel. Contacts of the model MFC are rated at 10 amp., 125 volts, ac.



PUSHBUTTON SWITCH—*Grayhill, 1 N. Pulaski Rd., Chicago 24, Ill.* Series No. 4000 switch has momentary contact with automatic return. It is rated at ½ amp., 110 volts, and is provided for panel mounting.

BEARING SEAL — *Johns-Manville Corp., 22 E. 40th St., New York 16, N. Y.* Oil seal packing for the protection of bearings uses no metal. The seal has a high factor of heel rigidity and a soft flexibility. Known as Clipper Seal, it has a heel of resin-bonded fabric to give it rigidity. The lip, made of a tough but soft flexible compound, is designed to vary the bearing area.

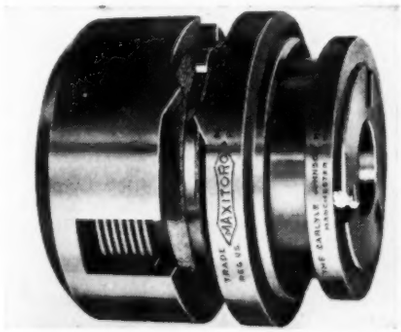
SPHERICAL BEARING — *Bantam Bearings Div., Torrington Co., South Bend 21, Ind.* Self-aligning spherical roller bearings are produced in sizes from 1.5748-in. bore upward. The bearing has two-directional thrust, high radial capacity, high thrust capacity, and unit construction for easy installation.

BEARING — *Kaydon Engineering Corp., Muskegon, Mich.* A conical-roller thrust design to supplement the straight-roller type of thrust bearing. This bearing design is such that the apex of the cone formed by the rollers meets at the true center of the bearing. This permits the rollers to align themselves between the tapered faces and the outside rib of the raceways.

BEARINGS — *Kaydon Engineering Corp., Muskegon, Mich.* The 4-row taper roller bearings have a high nickel content. Carburized with a deep case, this steel permits thinner cross sections in heavy-duty bearings.

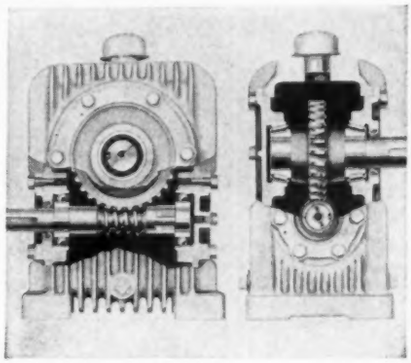
INDUSTRIAL BRAKE — *Linderman Devices, Inc., Newburgh, N. Y.* Line of brakes designed to apply accurately controllable continuous tension in industrial machinery is available either as self-contained units or for building into equipment under design. The absence of self-energizing action permits accurate control of the tension.

PIVOT GEAR JOINT—*Gray & Prior Machine Co., Windsor St., Hartford 5, Conn.* Alloy-steel heat-treated gears in a drop forged housing operate in any position between 3 and 139°. The unit is for manually operated remote controls.



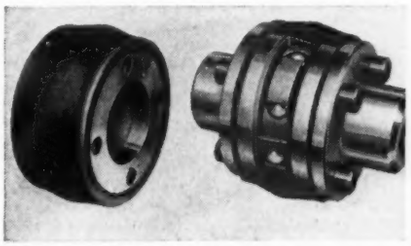
CLUTCH—*Carlyle Johnson Machine Co., Manchester, Conn.* Maxitorq automatic overload-release clutch is an adaptation of the Maxitorq floating-disk clutch with separator springs that keep this disk "floating" in neutral. The clutch can be made extremely sensitive to any overload condition. Available in ¼, ½, 1, 1¾, 3 and 5 hp.

SPEED SELECTOR — *Developed by Speed Selector, Inc., Cleveland, Ohio, and marketed by the B. F. Goodrich Co., Akron, Ohio.* A Speed Selector unit, using planetary gears which provide stepless speed control from full down to zero and into full reverse at constant torque of 2-hp. capacity. Two standard V-belts and four variable-pitch pulleys are used to drive the two input shafts of the planetary system. Changes are made by a hand control wheel which alters the pitch diameter of the pulleys.

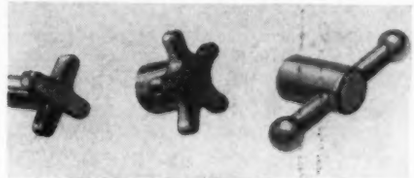


SPEED REDUCERS—*Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich.* A complete line of compact speed reducers is built around enveloping Cone-Drive gearing. The new line includes models with pinion under, pinion over, and with gear shaft vertical. The available ratios range from 5 to 1, up to 70 to 1.

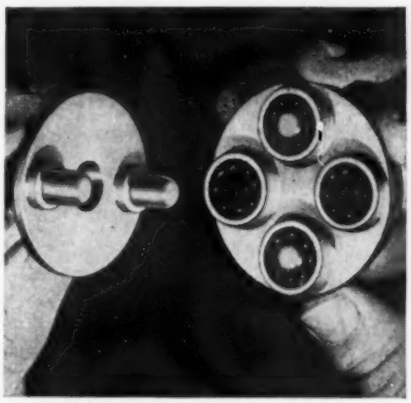
CLUTCH—*Carlyle Johnson Machine Co., Manchester, Conn.* Ring-type driving cups have been developed for the Maxitorq Multi-Disk clutches. These driving cups are said to provide economical means of adapting clutches to various types of driven or driving members. Made to standard specified limits, they permit piloting the inside or outside diameter with pulley, fly wheel, sprocket, gear, sheave, or other method.



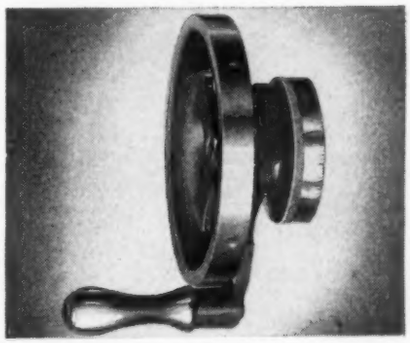
FLEXIBLE COUPLING—*Gear Grinding Machine Co., Detroit 11, Mich.* Ground steel balls are used in this coupling to provide the flexibility. The only flexible element is the synthetic covering which retains the lubricant and keeps out dust and liquids. Parallel misalignment up to ⅛ in. and angularity up to 3° is accommodated.



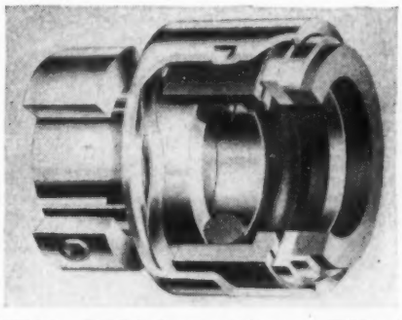
HAND KNOBS—*Machine Products Corp., Detroit, Mich.* Three types of hand knobs for machines and fixtures are made of cast iron and are available as rough castings or machined, with or without polished steel handles.



COUPLINGS — *Morse Chain Co., Detroit, Mich.* Small couplings, designed for low power-takeoff on fractional-horsepower drives, are available in two new sizes, handling 3 and 9 ft/lb torque. Stock bores are from ¼ to 1 in. Neoprene biscuit assembly shields machine from shock and permits slight angular misalignment.

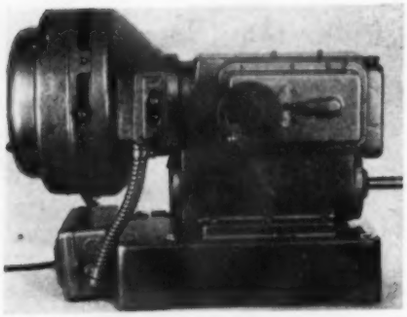


HANDWHEEL—*Gibbons Mfg. Co., Box 517, Worcester 1, Mass.* An improved safety handwheel, Model 5, is made in 4-, to 12-in. dia. stock sizes. When power is applied to the shaft, the safety handle disengages. When automatically disengaged it falls to the safety position with a braking action which serves to stop the handle in bottom position.



SEAL—*Sealol Corporation, 45 Willard Ave., Providence 5, R. I.* Seal for rotating shafts is designed for original equipment or replacement. "Sealol CB" is packaged as a complete seal, without loose parts. It is slipped into position on the shaft and locked in place with two setscrews. It is available for shaft sizes ½- to 1-in. dia.

VALVE ROTATION — *Thompson Products, Cleveland, Ohio.* Design uses standard locks and retainer neck so it can be used with any valve by changing the spring-retainer cap. Rotocap consists of five parts. When the valve is lifted rotation of the retainer cap and stem is produced.



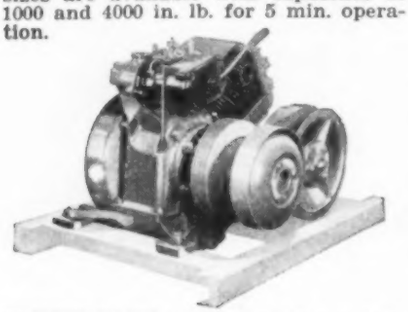
TRANSMISSION—*Portman Machine Tool Co., 70 Portman Road, New Rochelle, N. Y.* Hydraulic variable-speed transmission, Model HT 2 has an axial air-gap type, built-in electric drive motor in 2-, 3-, and 5-hp. ratings.

TRANSMISSION—*Western Manufacturing Co., 3400 Scotten Ave., Detroit 10, Mich.* Especially adapted to flat plate or platform mounting, this 9000-B unit has 5-hp. capacity with input speed of 900 rpm. Four gear changes are available through one shift lever with ratios 1:1, 2:1, 3:1, and 4:1.

THRUST BEARING—*SKF Industries, Inc., Front St. and Erie Ave., Philadelphia 34, Pa.* Spherical roller thrust bearing has a self-aligning principle which compensates for shaft deflection and distributes heavy loads evenly over all rollers. A cage retaining sleeve pressed into the bore of the inner ring makes a contained assembly of the rollers, cage, and inner ring.

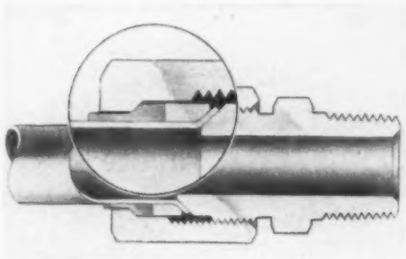
BALL BEARINGS—*Nice Ball Bearing Co., 30th and Hunting Park Ave., Philadelphia 40, Pa.* Bearings designed for precision applications where close-tolerance units are required for medium loads and for speeds of about 3,000 to 5,000 rpm. Series 1600 has one-piece inner and outer races.

ANGLE-DRIVE UNIT—*Payne Dean & Co., Madison, Conn.* An angle-drive unit developed for slow speed and high torque for intermittent operation is intended for control of oven doors, valves, and similar operations. Two sizes are available with capacities of 1000 and 4000 in. lb. for 5 min. operation.

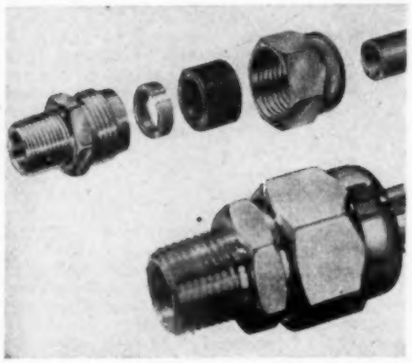


POWER UNIT—*Salsbury Motors, Inc., 4464 District Blvd., Los Angeles, Calif.* Automatic operation of adjustable-diameter pulleys is accomplished in the "Power Package." The Model 600 engine is a single-cylinder, four-cycle, air-cooled type, developing 645 hp. at 3200 rpm.

HYDRAULIC FUSES — *Simmonds Products, Inc., 21-10 49th Ave., Long Island City 1, N. Y.* Two types of hydraulic fuses serve as safety devices, designed to provide protection if there is a break in the hydraulic line. The quantity measuring fuse is designed to shut off after a predetermined amount of fluid has passed through it. It shuts off if a break in one of the two lines causes a pressure drop below predetermined values.



FITTING—*Flodar Corp., 331 Frankfort Ave., Cleveland, Ohio.* "Grip Tube" fitting has a heat-treated steel sleeve, the rear end of which is slotted to form spring fingers. Tightening of the nut contracts the fingers around the tube, gripping the tube uniformly.



COMPRESSION FITTING — *Gustin-Bacon Mfg. Co., Kansas City, Mo.* The Flexgrip fittings in standard sizes from ⅛ in. to ½ in. O.D., consists of four parts—body, gripping ring, synthetic rubber gasket and nut. Flexgrip tubing fittings are available in brass, aluminum or steel.

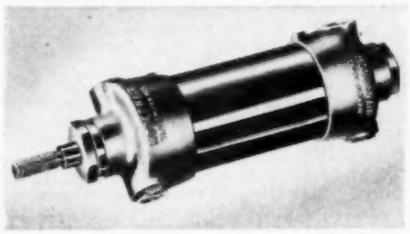
LINE REGULATOR—*Dockson Corp., 3839 Wabash Ave., Detroit, Mich.* A line regulator for air and CO_2, Model 45, is designed for use where it is necessary to reduce tank pressure to a range of from 1 to 75 lb.

ROTAMETERS — *Fischer & Porter Co., Dept. 4C-7, Hatboro, Pa.* For use where exposed glass tubes are dangerous or impractical, a line of armored Flowrators permit direct horizontal installation into the piping system. May be obtained as a standard flow-rate indicating meter, or as a recording-controlling or totalizer.

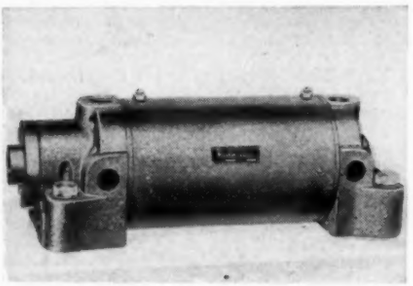
PRESSURE REGULATOR — *Grove Regulator Co., 6593 65 St., Oakland 8, Calif.* A small pressure regulator weighs 2 lb. and measures 2¾ x 3¼ in. It is suitable for handling initial pressures up to 3400 lb., with adjustable control range from 5 to 1500 lb.

HYDRAULIC SWITCH—*Merit Engineering, Inc., Clifford St., Providence, R. I.* Hydraulic-valve pressure-switch unit is a self-contained cartridge that is renewable and interchangeable. With two different spring cartridges, an operating range of 100 to 3200 psi. is available.

CYLINDER—*Logansport Machine Co., Logansport, Ind.* The fast, economical operation of air is combined with the smooth, controlled regulation of hydraulics in Air-Draulic cylinders. Cylinders are available in four standard sizes from 3- to 8-in. bore, with any length of stroke to 5 ft. The air piston is built for operation at pressures to 150 psi.



CYLINDER—*Modernair Corp., Oakland, Calif.* A cushion-type cylinder for air, water, or oil with interchangeable mounting methods. The cap can be rotated a full 360° on the cylinder without disturbing the seal, permitting simplified pipe connections.

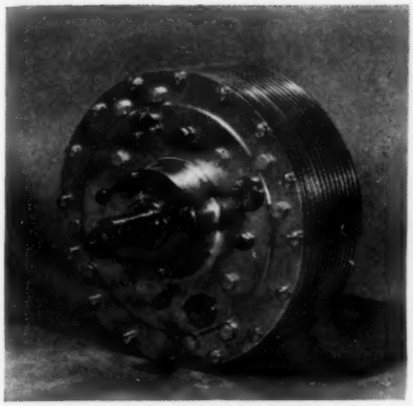


CYLINDERS — *Logansport Machine Co., Logansport, Ind.* Rotocast hydraulic cylinders, built for operating pressures to 1500 psi., are adapted for operations involving pushing, clamping, lifting, and other power movements. Made in seven mounting types, three piston-rod models, and nine standard bores.

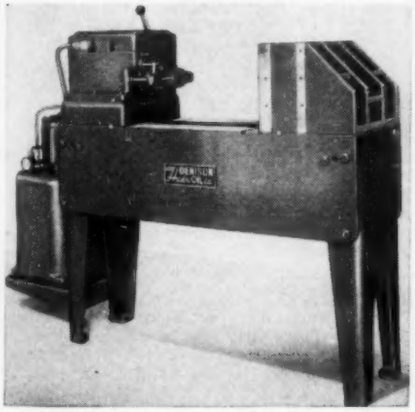
HYDRAULIC CYLINDERS—*Anker-Holth Mfg. Co., Port Huron, Mich.* Non-rotating hydraulic cylinders in 11 sizes and seven mountings are designed for 750 psi. to 2000 psi. Sizes range from 1½-in. to 8-in. bore. Mountings available include foot, trunnion, center line, clevis, rod-end flange, blind-end flange, and adapter.

AIR AND HYDRAULIC CYLINDERS — *Anker-Holth Manufacturing Co., Port Huron, Mich.* A series of non-rotating linear actuating cylinders designed for pushing, pulling, lifting or lowering operations, are of the dual-action type with tie rods eliminated. Cylinder bores from 3 to 14 in., with seven different mountings available are manufactured in air or hydraulic models.

ROTAMETER — *Brooks Rotameter Co., Landsdale, Pa.* For accurate flow-rate measurement and control. With metal tapered tube, it can be used for pressures up to 600 psi. Can be obtained as a simple indicator, or with remote instrument for recording or recording-controlling flow rate.



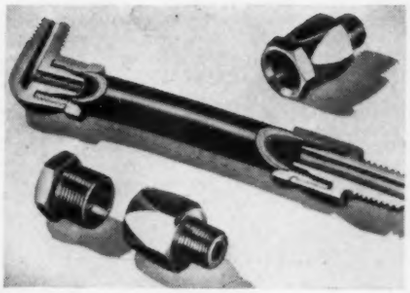
HYDRAULIC SPEED CONTROL—*Brad Foote Gear Works, Cicero 50, Ill.* Clutch and speed control are provided in the Speed Flo Drive. The drive is applicable to machine tools, maritime hoists, vehicles, and other uses. Shocks transmitted through the gear train are cushioned by the fluid in the drive.



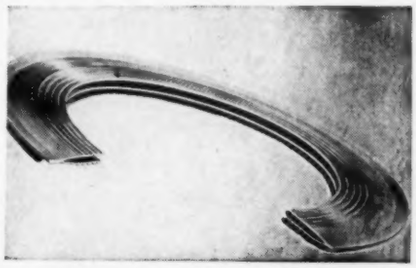
POWER UNITS—*Denison Engineering Co., Columbus 16, Ohio.* Hydraulic power units for application to any machine or to a standard frame incorporate hydraulic cylinder and ram, control valve, control lever and adjustment devices. Ram pressures are closely limitable up to 4 to 6 tons.

COUPLING—*The Snyder Sales Corporation, 5225 Wilshire Blvd., Los Angeles 36, Calif.* The All-Flex ball-bearing swivel pipe coupling is designed to convey fluids under high pressure through a pipe which rotates a full 360°.

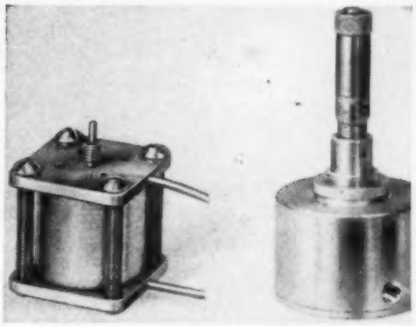
LIQUID-CUTOFF VALVE—*Johnson & Jennings Co., Cleveland 1¼, Ohio.* The V-202 automatic liquid-cutoff valve mounts on the outlet line of a storage tank. It closes automatically to prevent the introduction of air into the line.



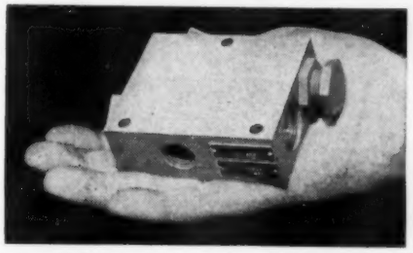
HOSE COUPLINGS — *Resistoflex Corp., Belleville, N. J.* Metal couplings for flexible hose can be used repeatedly and assembled by hand. The coupling nut threads onto the hose, then the coupling shell compresses the hose end into a safety-seal gasket. Design of the nut allows the hose to flex without cutting.



GASKET—*Goetze Gasket & Packing Co., Inc., New Brunswick, N. J.* Bellowseal uses the pressure to be sealed to exert a corresponding sealing pressure on the flange faces. It consists of two disks of metal welded together around outer periphery.

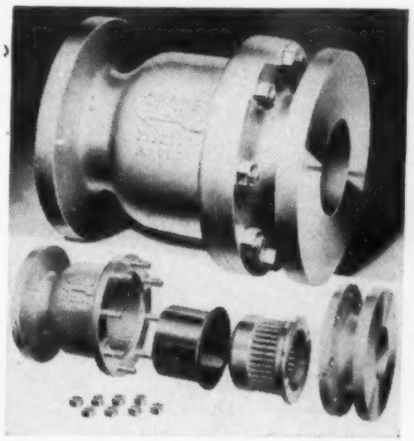


VALVES—*Standard Instrument Co., 15 Elkins St., South Boston 27, Mass.* Valves inclose 600 in. of capillary passage in a metal container 1½ in. sq. Flow control is obtained by moving the adjustable plunger varying the length of the capillary passage continuously from 4 in. to 600 in.



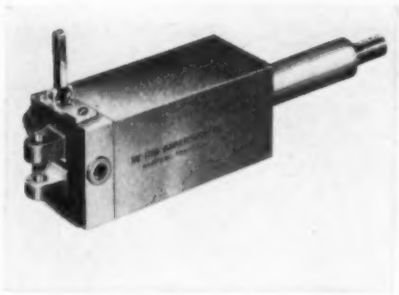
HYDRAULIC VALVES—*Electrol, Inc., Kingston, N. Y.* Hydraulic cut-out valve has a compact housing only 1¼ in. deep. Cut-out pressures can be supplied from 300 to 1500 psi., and differential pressure can be varied (in relation to the desired cut-out pressure) from 75 to 500 psi.

REGULATOR VALVE—*Grove Regulator Co., 65th and Hollis Sts., Oakland 8, Calif.* A flexible molded synthetic rubber tube in a Bakelite body is used in a three-way valve said to be satisfactory for controlling viscous or solid-carrying fluids. Non-metallic construction permits handling corrosive liquids or gases. The valves handle working pressure to 250 lb., max. temperatures of 150 F.

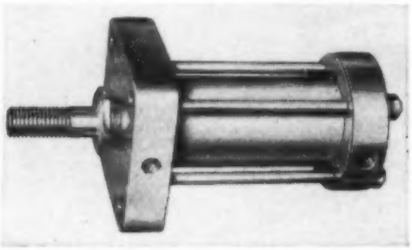


VALVE—*Grove Regulator Co., 653¼ Green St., Oakland 8, Calif.* Chexflo valve has a synthetic rubber tube stretched over a slotted, cup-shaped metal core, which expands to open and contracts to close.

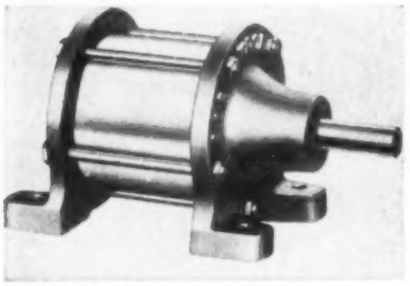
VALVES—*Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill.* The packless ¼-in. capacity valve, Hanna Unitite Jr., is for tubing and light piping applications. The foot-operated valve is a packless, effortless control for air and oil hydraulic cylinder application. Piston speed is controlled in both directions.



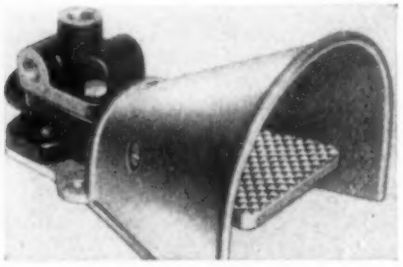
AIR CYLINDERS—*Fenn Manufacturing Co., Hartford, Conn.* Cylinders are designed and built to fit the customer's machine design. All unnecessary packing is said to be eliminated, reducing friction loss and maintenance cost. The cylinders are furnished in single-acting, double-acting, and differential-acting type.



AIR CYLINDERS — *Oakland Engineering Co., Inc., 800 100th Ave., Oakland, Calif.* New line of air cylinders has drilled mounting holes. Shouldered piston rods hold the pistons square with the cylinder walls.



CYLINDERS—*AirTrol, 2651 W. Lake St., Chicago 12, Ill.* Line of air cylinders in sizes of 1½ in. and up have a power factor from 1.76 times air line pressure. Cylinders have bronze ram bushings which are graphite impregnated. Foot control is available.

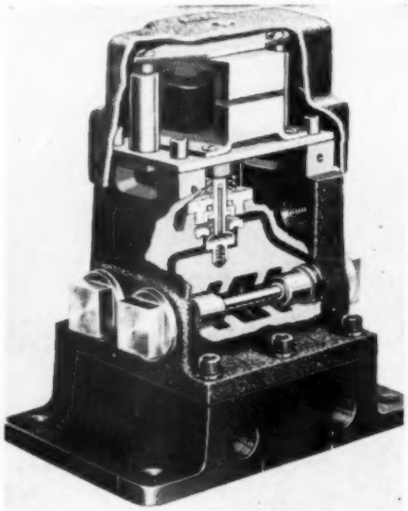


FOOT VALVE — *National Pneumatic Co., Rahway, N. J.* Universal-type, foot-operated valve for controlling compressed-air cylinders can be arranged to apply pressure with the pedal depressed or with the pedal released. The pedal is shielded to prevent accidental operation.

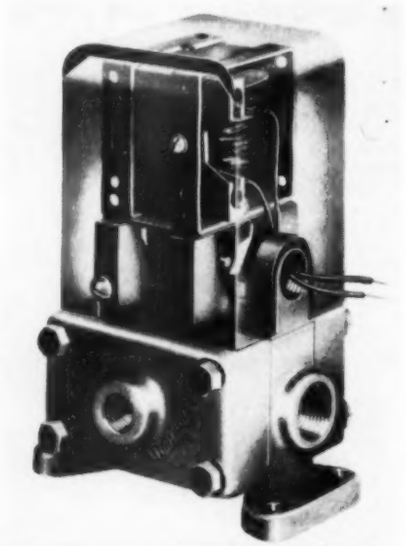
VALVE—*Leslie Co., 129 Delafield Ave., Lyndhurst, N. J.* Self-sealing, air-operating, ball-type valve, type BA, fitted with a hand-opening lever and a rotatable pivot so that the lever can be located in any position. Operating pressures up to 200 psi. are recommended.

SPEED-CONTROL VALVE — *Ross Operating Valve Co., 6477 Epworth Blvd., Detroit 10, Mich.* Flow of air from air cylinder to operating valve is regulated with precision, in either small or large volume.

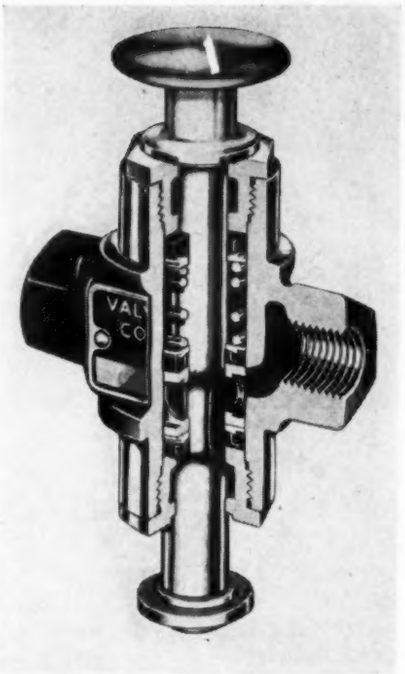
PNEUMATIC CHECK VALVE—*E. D. Bullard Co., 275 Eighth St., San Francisco, Calif.* Numatic Safety Check shuts off the air if air lines are accidentally disconnected or broken. Excessive flow of air through the valve causes a steel ball to roll up a slope where it seals the port.



AIR VALVE—*Ross Operating Valve Co., 6489 Epworth Blvd., Detroit 10, Mich.* Solenoid-controlled air valve is said to allow operating speeds up to 400 cycles per min. with current consumption 1.2 amperes at 110 volts, 60 cycles.

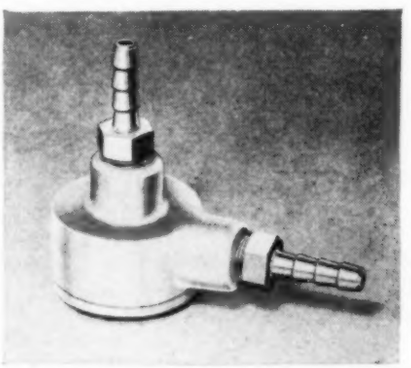


AIR VALVE — *Numatics. Milford, Mich.* A solenoid-controlled 3-way valve for compressed air is available in six sizes from ¼ to 1¼ in., to handle operating pressures from 0 to 150 lb. The user can select the setup desired by reversing the supply and outlet manifolds on the center body.



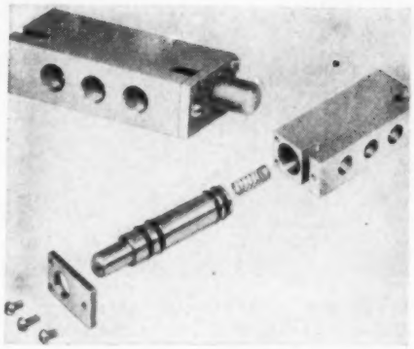
AIR VALVE—*Valvair Corp., 454 Morgan Ave., Akron 11, Ohio.* Area through the valves is equivalent to pipe sizes to eliminate air flow restrictions Cylindrical ends are identical permitting variety of control combinations. Valves operate on air pressures to 200 lb. and temperatures to 120 F.

AIR VALVE — *Numatics, Milford, Mich.* Four-way, hand-controlled air valve has working parts contained in the upper housing so that when servicing is necessary the mechanism can be removed from the base without disturbing pipe connection. H-4 series valves are available in six sizes from ¼ to 1¼ in.



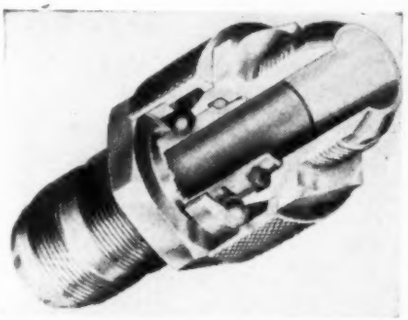
AIR VALVE—*Mead Specialties Co., Dept. E. V. 4, 4114 North Knox Ave., Chicago 41, Ill.* Quick-exhaust valve for pneumatic cylinders acts on the principle of a bellows to expel the air quickly. The valve opens as soon as the air supply is shut off, speeding the return stroke.

VALVE — *Galland-Henning Mfg. Co., Milwaukee, Wis.* Valve provides independent regulation of stroke speed in both directions in air cylinders. The Nopak Reciprotrol will operate any size or make of air cylinder at line pressures from 50 to 300 lb., air or hydraulic. Up to 500 cycles per minute are possible on small cylinders.



VALVE—*Modern Products Ltd., 952 S. Grand Ave., Los Angeles 15, Calif.* This CRV pilot valve is designed to be used as a three-way valve, normally either open or closed, or as a two-way valve, normally open or closed. It can be used to operate air cylinders, air motors, air controls, and single-acting cylinders. Can also be used in low-pressure hydraulic control and actuating systems.

TUBING COUPLING—*Warner Bros. Co., Spiratube Div., Bridgeport 1, Conn.* Coupling built into the tubing is a flat spring-steel collar, which may be compressed to slip inside the end of another section and then released to form a strong, tight joint. The sections are disconnected by compressing the inner spring and separating the tubing.

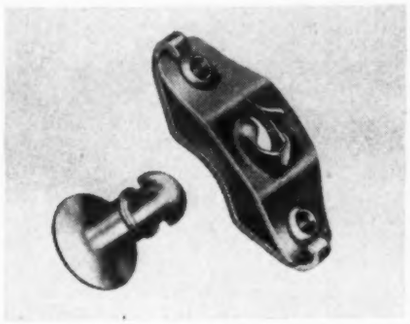


COUPLING — *Roylyn Mechanical Laboratory, 8928 Santa Monica Blvd., Los Angeles 45, Calif.* Suitable for air-driven tools and other uses, the coupling includes a cam ring, ball cage, and nipple. A slight shoulder on the cam assures positive lock—application of more pressure tightens the lock.

AIR CONTROL PANEL UNIT—*Marton Air Equipment Division, Lehigh Foundries, Inc., Easton, Penna.* Air control assembly includes an air valve, pressure regulator, lubricator, air strainer, and air gage. Designed to fit a cavity in machine tools and equipment. Size of the panel is 8 1/16-in. wide and 9 1/4-in. high. It will accommodate ⅜- or ½-in. pipe size.

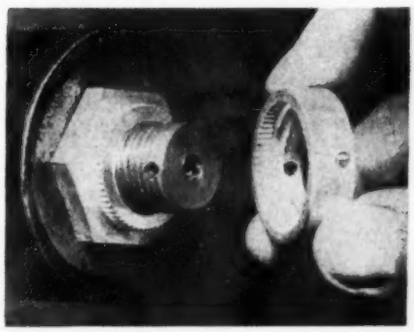
LOCK NUT—*Grip Nut Co., 310-C South Michigan Ave., Chicago 4, Ill.* Simple, triangular deflection on the top of the nut provides a controlled friction lock on the Gripco lock nut. The nut is free-spinning until the bolt threads contact the deflected threads near the top.

MONEL RIVETS—*Cherry Rivet Co., 231 Winston St., Los Angeles 13, Calif.* Blind rivets made of Monel have high strength, ductility, and excellent resistance to corrosion. The Monel rivet is of the same construction as Cherry rivets of aluminum, bronze, and steel.

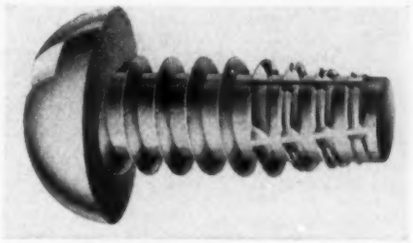


FASTENER — *Lion Fastener, Inc., East Main St., Honeoye Falls, N. Y.* Fastener consists of a stud and a cantilever spring assembly. The spring assembly is spot welded or riveted in place. When assembly is desired, a quarter turn of the head locks the stud.

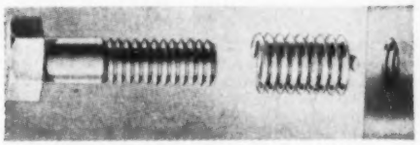
SPEED NUTS—*Tinnerman Products, Inc., 2113 Fulton Road, Cleveland 13, Ohio.* Line of heat-treated, spring-steel speed nuts includes sizes to fit the ten most popular sizes of machine screws and sheet metal screws. The new speed nuts are said to be more compact, withstand higher torque tightening, than previous models.



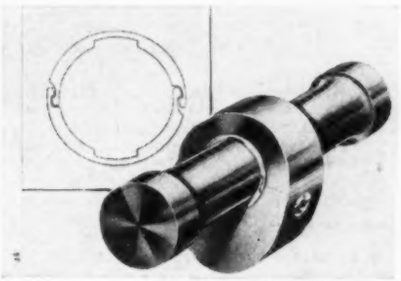
ADJUSTMENT NUT—*E. S. Firestone Engineering Co., 11127 Magnolia Blvd., North Hollywood, Calif.* Mating serrations permit the 60-station adjustment nut to be set at desired tension and locked in position with a cotter-key. Settings as fine as 0.001 in. on 16-pitch threads are possible.



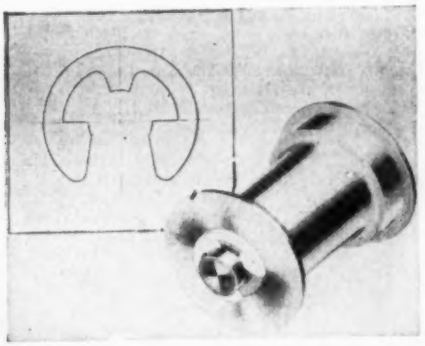
SELF-TAPPING SCREW — *Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.* For fastening to comparatively thin sections in friable and brittle plastics this type F-Z screw combines the thread-cutting characteristics of Type F with the coarse-pitch advantages of Type Z.



THREAD INSERTS—*Aircraft Screw Products Co., Inc., Long Island City, N. Y.* Aero-Thread and Heli-Coil inserts are used where wear of the tapped threads is likely to occur. The insert is made of wire in a diamond cross section and is inserted into the tapped thread with a special inserting tool. When released, the spring tension in the coil forces the outer edges snugly into the tapped thread holding the insert in place.



RETAINING RING—*Waldes Kohinoor, Inc., Long Island City 1, N. Y.* Retaining ring of two-part interlocking construction known as the Truarc interlocking ring, type 5107, forms a complete annular shoulder of uniform section height around the circumference of the shaft. The ring is dynamically balanced.



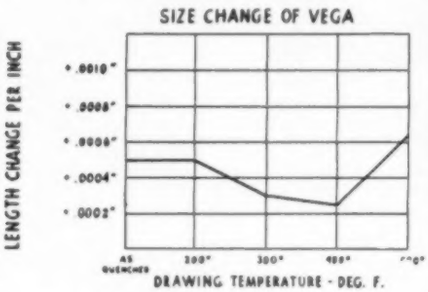
RETAINING RING — *Truarc Sales Division, Waldes Kohinoor, Inc., 47-10 Austel Place, Long Island City 1, N. Y.* A line of "E"-shaped retaining rings, suitable for shafts 3/32 in. and over, is designed to withstand considerable thrust. Three protrusions, equally spaced, form the abutments in the groove of the shaft.

PARTS AND MATERIALS—Materials, Processes

STEEL—*Latrobe Electric Steel Co., Latrobe, Pa.* Eliminating segregation of carbides in the center, the bars and other shapes produced by this process are named Desegatized Steel. In shop performance, this steel is said to show uniformly superior results under heat-treatment, longer tool life, longer run between grinds, reduction of warpage and breakage.

STEEL—*Jessop Steel Co., Washington, Pa., in collaboration with Barium Steel and Forge Co., Inc., Canton, Ohio.* A new method of processing high-speed steel rounds in diameters greater than 4 in., is said to prevent carbide segregation in the central portion of the round. Known as Vee-Oginizing, steel has a uniform carbide distribution throughout.

STEEL—*Capewell Mfg. Co., 60 Governor St., Hartford 2, Conn.* Precision ground flat stock is manufactured from electric furnace steel, annealed for easy machinir g, and is ground within 0.001 in. in thickness. It can be hardenend in either oil or water to Rockwell "C" 66.



DIE STEEL—*The Carpenter Steel Co., Reading, Pa.* Vega steel provides good hardness in heavy sections, hardens at low temperatures, keeps dimensional changes in heat-treatment to a minimum. Cooling from 1550 F. in a free circulation of air hardens the steel. The steel is intended for tools used in blanking, piercing, trimming, and forming sheet metal in both light and heavy gages.

DIE STEEL—*Carpenter Steel Co., Reading, Pa.* A new air-hardened die steel is said to provide tool and die makers with easy, low temperature heat-treatment, uniform hardening in heavy sections, and minimum distortion and size change.

TOOL STEEL—*Vanadium-Alloys Steel Co., Latrobe, Pa.* A cutting material with carbon content said to be higher than any previously produced is "Vasco Supreme." The high carbon content results in increased wear resistance and contributes to high hardness from heat-treatment.

DIE STEEL—*Firth-Sterling Steel Co., McKeesport, Pa.* Designated Cromovan, this steel is intended for cutting and forming dies and for some types of punches, rolls, gages, taps, reamers, lathe centers, and spinning tools. Cromovan is said to have minimum dimensional change during hardening, hardness of unusual depth from air cooling or oil quenching, and good machinability.

PLASTIC CAPS AND SLEEVES—*General Electric Co., Pittsfield, Mass.* A plastic material to afford a protective means for industrial products possesses good electrical, physical and chemical properties. It is tough, durable, and resilient, as well as water, acid, and alkali resistant.

STAINLESS STEEL CHANNELS—*Joslyn Manufacturing & Supply Co., Ft. Wayne, Ind.* Stainless steel channels are produced hot rolled, annealed and pickled, in AISI Types 302, 304 and 316. Sizes are ¾ x ⅜ x ⅛ in., to 2½ x ⅝ x ¼ in. in any desired length.

STEEL—*W. J. Holliday & Co., Hammond, Ind.* "Speed Treat" steel is available in standard sized rolled flats, in 20-ft. lengths from ½- to 3-in. thick in standard widths. They eliminate the necessity for torch cutting when stock of narrow width is needed.

FOAMED PLASTIC—*DuPont Co., Wilmington 98, Del.* Cellular cellulose acetate CCA for short, is intended for use as a strong, light core for airplane panels and other structures. Lighter than cork, CCA combines insulation against heat and cold with structural strength when bonded between two sheets of metal, wood, or plastic.

PLASTIC—*Duorite Plastic Industries, 8564 W. Washington Blvd., Culver City, Calif.* A rubber-like plastic for making molds for casting plastic parts, Duroflex, can be used repeatedly. Because of its flexibility it can be stretched to remove castings.

PLASTIC COATING — *Puritan Co., Inc., Rochester 6, N. Y.* Protective coating applied at room temperature, Plastipak, is a resinous compound that dries in air to form a clear, tough, elastic, transparent or colored film. The coating can be applied by dipping or spraying, can be stripped off in a continuous sheet when desired.

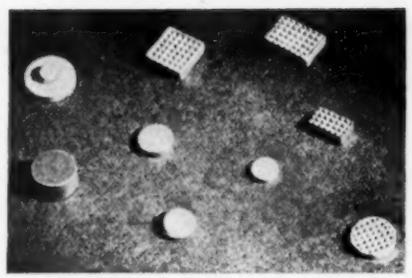
PLASTIC—*DuPont Co., Wilmington 98, Del.* This material known as "Teflon" is a plastic that withstands acids which dissolve gold and platinum and retains its strength and form at higher temperatures than any known organic material.

PERMANENT-MAGNET MATERIALS—*General Electric Co., Schenectady, N. Y.* Cunico is malleable, ductile and machinable. Cunife is similar to cunico except that it has directional properties. Vectolite is said to be first non-metallic, non-conducting magnet material ever made. Alnico 12 is cast and must be ground to shape. Silmanal is ductile and malleable.

NICKEL SILVER ALLOYS—*Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis.* A series of stainless white alloys, Ampcoloy Nickel Silver, containing 20 to 30% nickel, for use in food processing equipment. Four grades are regularly available including, in addition to the nickel, small amounts of tin, manganese, iron and lead, with the balance copper.

BERYLLIUM-COPPER ALLOYS — *Akron Bronze & Aluminum Co., 579 Washington St., Akron, Ohio.* Three types of Viculoy beryllium copper. No. 1 when exposed to high temperatures shows a lower strength loss than usual non-ferrous alloys. No. 2 is a hardened alloy suited to applications in welding equipment. No. 3 is a heat-treatable alloy suited for castings subjected to high impact loads, high pressures, high speeds and exceptional stresses.

CEMENT—*Kindt-Collins Co., 12651 Elmwood Ave., Cleveland 11, Ohio.* Master disk cement is for applying cloth-backed and flexible paper disks to a teel disk-grinding machines. The cement is said to be both easy to apply and to remove.



ALLOY FOR HEAVY CURRENTS—*Callite Tungsten Co., Union City, N. J.* A silver-molybdenum alloy "Callinite Type SM" is suitable for switch contact surfaces designed to handle heavy current. It is a high conductivity facing material for applications requiring high current where pitting, sticking, or welding of contacts occurs.

HIGH-DENSITY ALLOYS — *Callite Tungsten Corp., Union City, N. J.* Dense Alloy 112 is available in three types. Type P is largely tungsten, copper, and nickel; type E tungsten, cobalt, and silver; and type Y tungsten, cobalt, and nickel. The alloys are said to be especially adaptable for use as balancing weights and to be readily machinable for precise balancing.

COPPER-TUNGSTEN ALLOYS — *Ampco Metal, Inc., Milwaukee 4, Wis.* A line of copper-tungsten alloys, in the form of rods, bars, and inserts for projection and flash welding, die facing and inserts, electrical upsetting and forging dies, and similar applications.

CORE SAND BINDER — *Resinous Products & Chemical Co., 222 W. Washington Sq., Philadelphia 5, Pa.* A synthetic resin binder that improves core sand used in casting aluminum and magnesium, Uformite 580, is a urea-formaldehyde resin that requires no departure from standard preparational procedure, but permits the casting of complicated members.

MOLDING ALLOY—*Trethaway Associates, 37 Wall St., New York, N. Y.* An alloy for use as a molding material for casting plastics, rubber, and other material, called Moldaloy melts at 43) F, has a hardness of 22 Brinell, compression of 8,000 psi., tensile strength of 11,500 psi., and shrinkage of approximately 0.001 in. per in.

POWDERED-METAL PROCESS — *Micro Metalic Co., 99-16 Metropolitan Ave., Forest Hills, N. Y.* Process for mass production of stainless steel parts by powder metallurgy. The powdered-metal parts combine high strength with ductility (55,000 to 65,000 psi and 10% elongation).

SLENDER TURNING PROCESS — *Karge & Son Machine Co., Brockport, N. Y.* A process for turning slender parts with diameters from 1/32 to 1 in. and lengths up to 40 ft. Slender taper shafts can be produced by the process.

INSULATION STRIPPING — *The Fairchild Camera & Instrument Corp., Jamaica, N. Y.* Synthetic coatings such as Formex and Formvar in wire sizes up to No. 55, and wire covered with enamel, nylon, or other synthetics can be removed by the process. Wire is dipped to the desired depth in Material A for between 5 and 10 seconds, then into Material B for about the same time. The wire is stroked gently between thumb and forefinger to remove the insulation.

SHEFFIELD MACHINE TOOL DATA

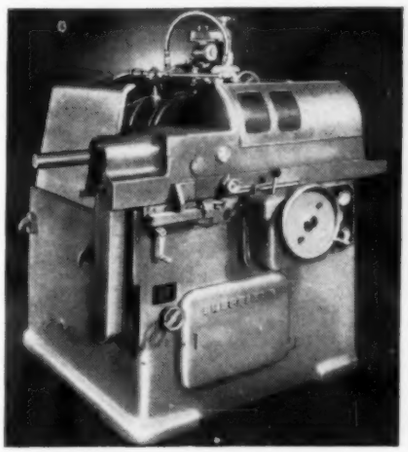
TFG - #123-4

NEW PRECISION ANNULAR FORM GRINDER FOR CRUSHTRUE GRINDING

Sheffield announces a Precision Annular Form Grinder as an addition to its line of precision grinders. This new machine utilizes the Crushtrue principle of wheel dressing for the rapid production of cylindrical forms such as circular form tools, crusher rolls, ball bearing races and seals, shift grooves in automotive and farm implement transmission gears, and other annular forms of intricate and precise profile.

MACHINE FEATURES:

Live or Dead Center Workhead
Infinitely variable work speeds
Semi-Automatic Power Crushing
Wheels form dressed up to 2" face
Swings 7" work 12" between centers
Precision work spacing device



Write for Engineering Data TFG 123 and 124

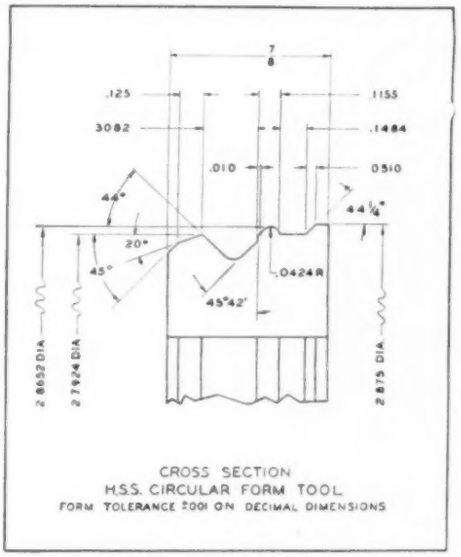
GRINDING TIME CUT FROM 4½ HOURS TO 4 MINUTES

This circular tool has a contour involving a blend of radii, straight sides, angles and flats. Prior to using the Crushtrued full form wheel, the work had been made on universal cylindrical grinders by toolroom procedure in lots of 15 to 30, and the grinding time of 4½ to 5 hours per tool was considered top performance.

A master Crushtrue Roll, made on the Micro-Form Grinder, was used to true the wheel on the Precision Annular Form Grinder shown above.

Grinding from the solid required 13 minutes. Grinding on preformed stock having approximately .020" on a side required less than four minutes.

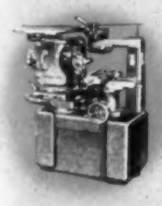
The time required to make the Crushtrue roll compares with that of making the circular tool by conventional means. Therefore, the crush grinding process would show savings that become phenomenal as the quantities increase.



CROSS SECTION
H.S.S. CIRCULAR FORM TOOL
FORM TOLERANCE .0001 ON DECIMAL DIMENSIONS

Previous grinding time	270 minutes
Crushtrue grinding time	4 minutes
Time saving	266 minutes
Percent Time Saved	98.5%

Thousands of other production cost problems can be answered satisfactorily by crush grinding with Sheffield equipment. Write for Bulletins M-100-145 and M-120-146.



THE SHEFFIELD CORPORATION

Dayton 1, Ohio, U.S.A.

MACHINE TOOLS · GAGES · MEASURING INSTRUMENTS · CONTRACT SERVICES

NOW EVEN MORE CONVENIENT...

STARRETT
Precision Ground
FLAT STOCK

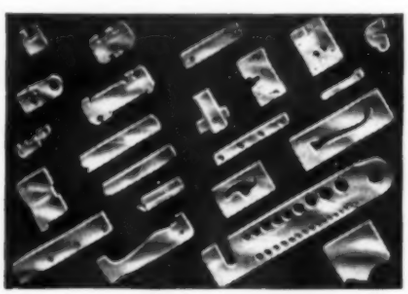
COMES IN TWO TYPES

Oil Hardening

A non-deforming, electric furnace tool steel, fully spherodized annealed with fine grain structure and deep hardening characteristics. Ideal for precision parts requiring accuracy of size after hardening.

Water Hardening

A high grade tool steel specially made to Starrett specifications. Annealed for easy machining. Develops maximum hardness when quenched in water or brine and may be drawn to any desired temper in oil.



FOR PARTS LIKE THESE

TEST TOOLS	PARALLELS	TEST GAGES
DIE WORK	MACHINE PARTS	SNAP GAGES
JIG PARTS	SHIMS	TEMPLATES
FIXTURES	PUNCH DIES	CUTTERS

Save time on countless jobs of making templates, test tools, gages, dies, small parts and miscellaneous pieces.

With Starrett *Precision Ground* Flat Stock, you simply lay out the part and go ahead. No hunting for odd pieces of stock, no time lost on preliminary roughing or precision grinding to size. Made in 18 inch lengths in widths from ½ to 6 inches and in thicknesses from a sixty-fourth to an inch or more. The two flat sides are precision ground parallel and straight to within .001 inch of size. Ends are machined square and sides are ground parallel and square. Each piece is individually wrapped for complete protection and clearly identified for storage and selection.

Keep a stock of frequently used sizes in the tool crib or buy it as needed through your mill supply distributor. Write for Ground Flat Stock Folder and Chart C which gives complete information, list of sizes and hardening instructions.

Buy Through Your Distributor

THE L. S. STARRETT CO. · ATHOL · MASSACHUSETTS · U. S. A.

World's Greatest Toolmakers

STARRETT

PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK
HACKSAWS • BAND SAWS FOR CUTTING METAL, WOOD, PLASTICS

STARRETT GROUND FLAT STOCK

Alloys for Heat and Corrosion-Resistant Castings

REVISED designations for general composition of alloys for heat and corrosion-resistant castings have been issued by the Alloy Casting Institute. The list now comprises 46 designations, which are issued to assist the buyer to distinguish the general compositions most suitable for castings as contrasted to other specifications for alloys customarily used in wrought form. Composition ranges satisfactory for rolled products are often not desirable for castings.

Complete chemical compositions are not given with these designations because the exact chemistry of the alloy supplied depends upon the application. The conditions of use should be made known to the foundry, to permit suitable adjustment of the alloy composition.

In the case of corrosion-resistant castings, composition ranges with the designations show nickel, chromium and carbon content as well as the normal ranges of special alloy additions such as molybdenum, columbium and selenium. Carbon content is not shown for the heat-resistant alloys because in most applications it is not a critical factor.

All designations begin with the letters "C" or "H", indicating alloys for corrosion of heat-resisting applications, respectively. The second letter indicates the nickel and chromium ranges, the nickel increasing from "A" to "Z". The following number designates the maximum carbon content in hundredths of one percent carbon. If special alloys are included in the composition, they are indicated by letters or symbols after the number: for example, M—molybdenum, C—columbium, Se—selenium.

DESIGNATION	% NICKEL	% CHROMIUM	% CARBON	% OTHER ELEMENTS
CA-15	1 max.	11 to 14	.15 max.	—
CA-40	1 max.	11 to 14	.20 to .40	—
CB-30	2 max.	18 to 22	.30 max.	—
CC-50	4 max.	26 to 30	.50 max.	—
CE-30	8 to 11	26 to 30	.30 max.	—
CF-7	8 to 10	18 to 20	.07 max.	—
CF-10	8 to 10	18 to 20	.10 max.	—
CF-16	8 to 10	18 to 20	.16 max.	—
CF-20	8 to 10	18 to 20	.20 max.	—
CF-7 Se	8 to 10	18 to 20	.07 max.	Selenium 0.20 to 0.35
CF-7 C	8 to 10	18 to 20	.07 max.	Columbium*
CF-7 M	8 to 10	18 to 20	.07 max.	Molybdenum 1.5 to 3.5
CF-10 M	8 to 10	18 to 20	.10 max.	Molybdenum 1.5 to 3.5
CF-16 M	8 to 10	18 to 20	.16 max.	Molybdenum 1.5 to 3.5
CG-7	10 to 12	20 to 22	.07 max.	—
CG-10	10 to 12	20 to 22	.10 max.	—
CG-16	10 to 12	20 to 22	.16 max.	—
CG-16 Se	10 to 12	20 to 22	.16 max.	Selenium 0.20 to 0.35
CG-7 C	10 to 12	20 to 22	.07 max.	Columbium*
CG-7 M	10 to 12	20 to 22	.07 max.	Molybdenum 1.5 to 3.5
CG-10 M	10 to 12	20 to 22	.10 max.	Molybdenum 1.5 to 3.5
CG-16 M	10 to 12	20 to 22	.16 max.	Molybdenum 1.5 to 3.5
CH-10	12 to 15	22 to 26	.10 max.	—
CH-20	12 to 15	22 to 26	.20 max.	—
CH-10 C	12 to 15	22 to 26	.10 max.	Columbium*
CH-10 M	12 to 15	22 to 26	.10 max.	Molybdenum 1.5 to 3.5
CK-25	19 to 22	23 to 27	.25 max.	—
CM-25	19 to 22	8 to 11	.25 max.	—
CN-7	20 to 30	18 to 22	.07 max.	(May contain other elements)
CT-7	34 to 37	13 to 17	.07 max.	(May contain other elements)
HB	2 max.	18 to 22	—	—
HC	4 max.	26 to 30	—	—
HD	3 to 6	26 to 30	—	—
HE	8 to 11	26 to 30	—	—
HF	8 to 11	18 to 23	—	—
HH	11 to 14	23 to 27	—	—
HI	14 to 17	26 to 30	—	—
HK	19 to 22	23 to 27	—	—
HL	19 to 22	28 to 32	—	—
HN	23 to 26	18 to 22	—	—
HP	29 to 31	28 to 32	—	—
HS	29 to 32	8 to 12	—	—
HT	33 to 37	13 to 17	—	—
HU	37 to 41	17 to 21	—	—
HW	58 to 62	10 to 14	—	—
HX	64 to 68	15 to 19	—	—

**Columbium: 8 x Carbon—1.00% max.*

Designations with the initial letter "C" indicate alloys generally used to resist corrosive attack at temperatures less than 1200° F. Designations with the initial letter "H" indicate alloys generally used under conditions where the metal temperature is in excess of 1200° F.

All of the above designations apply to type compositions and no attempt is made to cover elements such as manganese, silicon and, in the case of heat-resistant alloys, carbon

AVAILABLE *Now!*

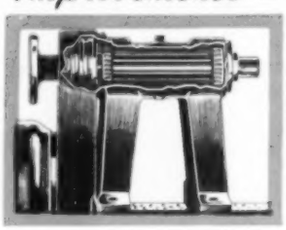
BEDINGER

Metal Spinning
LATHES

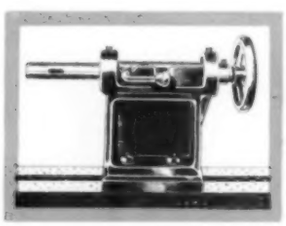
14" and 18" STRAIGHT BED • 27" STRAIGHT BED CONVERTIBLE

No Wait or Delay!

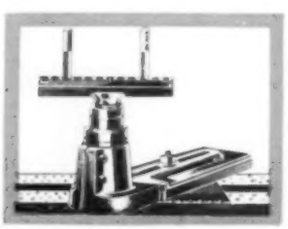
BEDINGER *Engineered Improvements*



These tapered roller bearings running in oil, precision adjusted to eliminate end-play, will withstand maximum continuous combination thrust load. The *production proved* spindle mount.



Combination screw tailstock with 4" and 9" fast travel rotary cam safety lock. 2" screw take-up can be used in combination with cam-lock in either 4" or 9" position (Pat. applied for).



Tool-rest. Two 1" spacers and 1" threaded collar on T-rest shank assure positive vertical adjustment. Interlocking serrated collars automatically lock T-rest shank in any position. T-rest cannot turn or slip. (Pat. applied for).

You invest no more in a fine Bedinger Spinning Lathe than other makes; you get sensible, engineered improvements that speed production, insure long operating life.

27" straight bed shown above, equipped with single-speed motor and 4 speed Lima Drive. For flexibility we recommend 2-speed motor with Lima drive. A push of button changes from low to high or high to low without stopping spindle.

V-belt from drive to spindle and heavy, solid construction eliminates part spoilage caused by vibration.

CLIP AND MAIL *today!*

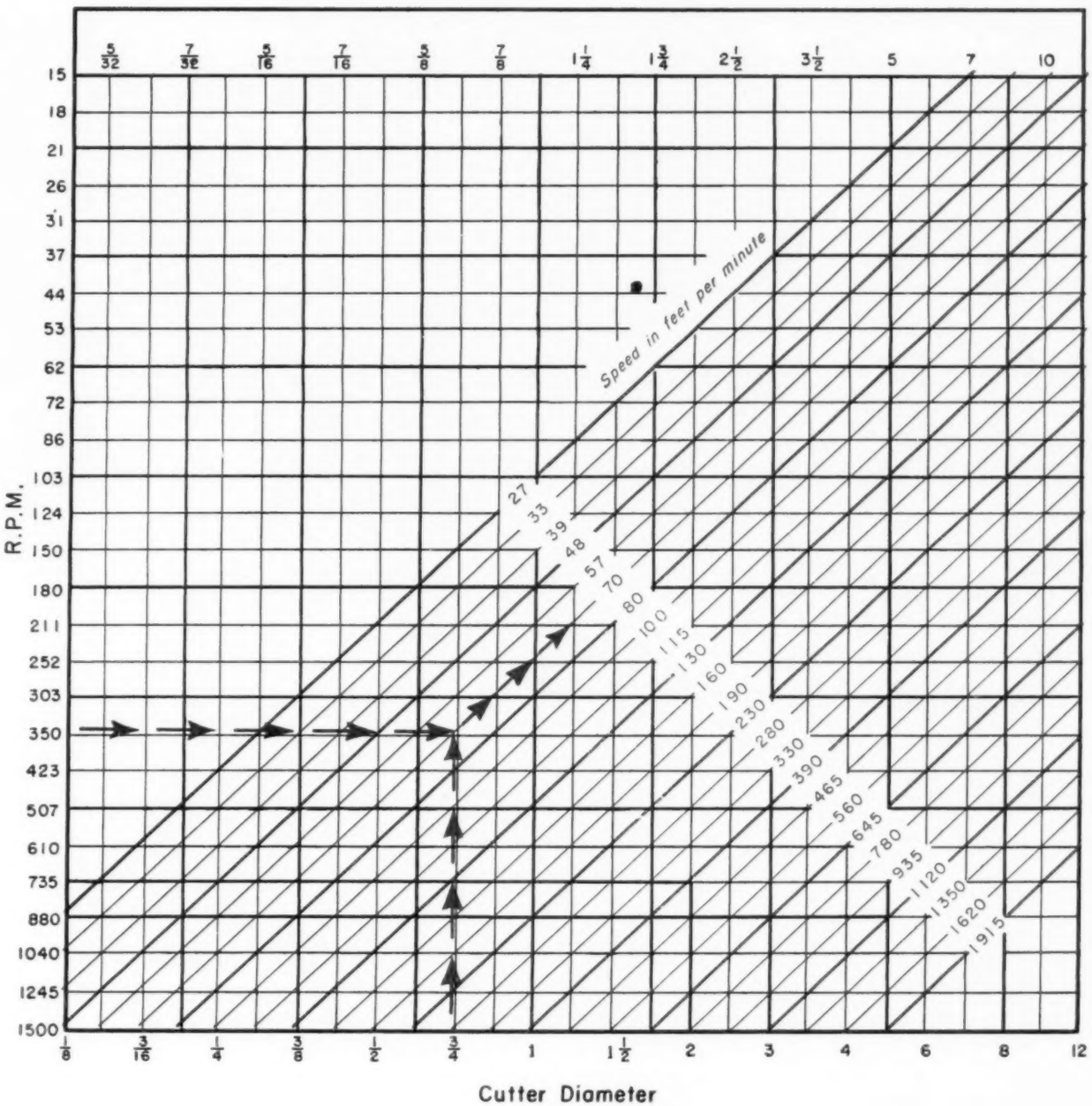
BEDINGER PRECISION CO.
815 Cahuenga
Los Angeles 38, California
Please send me complete information as to price, specifications and delivery date on a Bedinger lathe. I am interested in a

☐ 14" straight bed ☐ 18" straight bed
☐ 27" straight bed convertible ☐ 27" x 60" gap bed

Firm Name _____
Title _____
Street _____
City and State _____

Speed Chart for Milling Machines

BY PAUL C. ZIEMKE



THE approximate surface speed of the cutter is found on the diagonal lines as follows: Run a vertical line from the cutter diameter and a horizontal line from the cutter speed. The intersection of these lines will fall upon or close to a diagonal line representing surface speed. Example: $\frac{3}{4}$-in. cutter at 350 r.p.m. is traveling at 70 sfpm.

Frequently the operator will start with a known cutter diameter and a desirable surface speed for the material. In this case, read to the left from the intersection of the proper diagonal line and the vertical line dropped to cutter diameter. Example: $\frac{3}{4}$-in. cutter, 100 sfpm., for which proper cutter speed is 507 r.p.m. If in doubt, start with slow speed and feed and step up slowly.

"When can you ship stainless steel bars?" is important—and here Armco's Rustless Division offers you a decided advantage. Your order for *stainless bars* can be shipped promptly from our mill or the nearest Armco Distributor.

The reason is that Armco mills are busy 'round the clock rolling more than 60 standard and special grades of stainless bars. Many grades and shapes are always on the mills and can be supplied quickly.

This wide variety of grades—unsurpassed in the industry—enables you to choose a *specific steel* to fit your requirements.

TO NEW USERS

Perhaps you are a manufacturer who has never used stainless steel bars, but believe their excellent resistance to heat and corrosion, or their attractive appearance, can solve one or more of your problems. If so, just tell us about the application and we will give it prompt attention.

Whether it's information on how to fabricate, or how the finished equipment will perform in service, we have it and can get it to you without delay.

WIRE OR WRITE

For prompt service on your order for ARMCO Stainless bars, phone, wire or write our district office nearest you, or our Rustless Division, 3401 East Chase Street, Baltimore, Maryland.

Rustless Division of ARMCO

The American Rolling Mill Company • Middletown, Ohio

Special-Purpose Sheet Steels • Stainless Steel Sheets, Strip, Bars and Wire

Keyways for Holes In Gears

The American Gear Manufacturers Association has revised its standard 261.01 "Keyways for Holes in Gears for General Industrial Practice." This revision is in agreement with the American Standard Association's publication B17.1-1943, entitled "Shafting and Stock Keys." Details of the standard are:

Depth of Keyways

The depth of keyways shall be one-half of the key height measured at the edge, according to Fig. 1.

Fig. 1 and the table are also used for plain and gib head taper keys with the standard taper of ⅛ in. per ft. where the depth shown is the deep end of the keyway.

Where the depth of keyway is measured on the centerline of the key instead of the vertical wall as recommended, use the formulae shown in Fig. 2.

It is understood that these keys are to be cut from cold-finished stock and are to be used without machining, as this AGMA Standard is for general industrial practice. The keystock is to be cold-rolled steel 0.10 to 0.20 carbon.

Keystock to vary from the exact nominal size in width and thickness to a negative tolerance as follows:

3/32 in. square to 3/8 in. square, inclusive	0.002 in.
1/2 in. square to 3/4 in. square, inclusive	0.0025 in.
7/8 in. square to 1 1/2 in. × 1 in. flat, inclusive	0.003 in.
1 3/4 in. × 1 1/4 in. to 3 in. × 2 in. flat, inclusive	0.004 in.
3 1/2 in. × 2 1/2 in. to 5 in. × 3 1/2 in. flat, inclusive	0.005 in.

Keyways to be cut from exact nominal size to plus 0.002 in. in width, and depth shall be nominal to plus 1/64 in. for straight keys. For taper keys depth shall be nominal to 1/64 in. minus.

For heat-treated pinions the depth shall be 1/32 in. to 3/64 in. over nominal size with a minimum radius of 1/32 in. in corners of keyways.

For highly stressed or alternating loads encountered, it is recommended that the corners of the keyway be rounded to a minimum of 1/32 in. radius and not over a maximum of 1/5 of the keyway depth. The edges of the keystock are to be rounded to correspond.

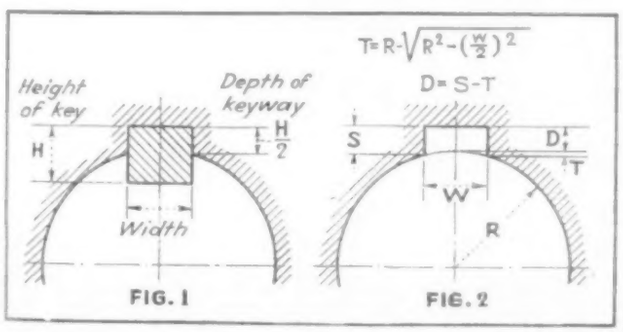


FIG. 1 FIG. 2

KEYWAYS AND KEY STOCK FOR HOLES IN GEARS

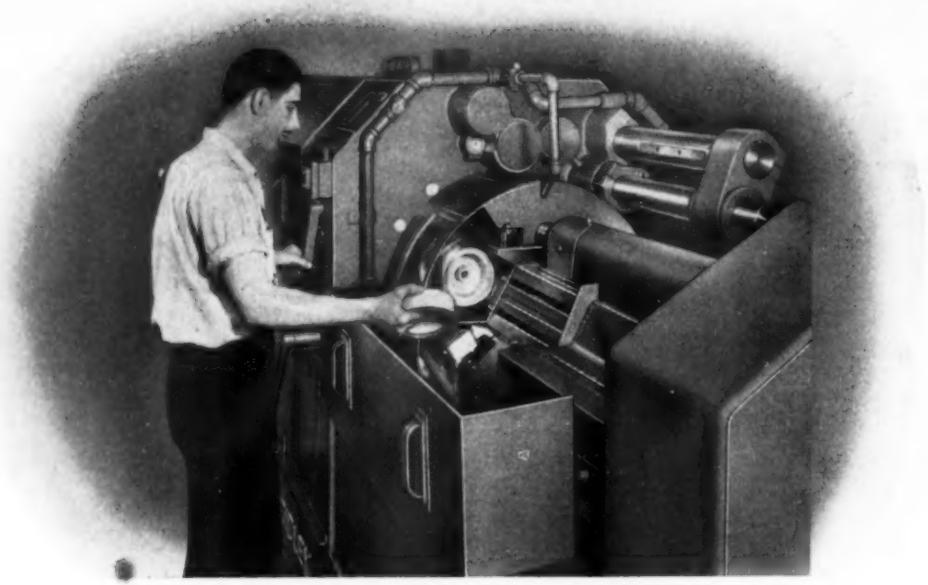
DIAMETER OF HOLES INCLUSIVE, IN.	STANDARD KEYWAYS AND KEYS		
	KEYWAYS		KEY STOCK
	WIDTH	DEPTH	
5/16 to 7/16	3/32	3/64	3/32 × 3/32*
1/2 to 9/16	1/8	1/16	1/8 × 1/8
5/8 to 7/8	3/16	3/32	3/16 × 3/16
15/16 to 1 1/4	1/4	1/8	1/4 × 1/4
1 5/16 to 1 3/8	5/16	5/32	5/16 × 5/16
1 7/16 to 1 3/4	3/8	3/16	3/8 × 3/8
1 13/16 to 2 1/4	1/2	1/4	1/2 × 1/2
2 5/16 to 2 3/4	5/8	5/16	5/8 × 5/8
2 13/16 to 3 1/4	3/4	3/8	3/4 × 3/4
3 5/16 to 3 3/4	7/8	7/16	7/8 × 7/8
3 13/16 to 4 1/2	1	1/2	1 × 1
4 9/16 to 5 1/2	1 1/4	7/16	1 1/4 × 7/8
5 9/16 to 6 1/2	1 1/2	1/2	1 1/2 × 1
6 9/16 to 7 1/2	1 3/4	5/8	1 3/4 × 1 1/4*
7 9/16 to 8 15/16	2	3/4	2 × 1 1/2*
9 to 10 15/16	2 1/2	7/8	2 1/2 × 1 3/4*
11 to 12 15/16	3	1	3 × 2 *
13 to 14 15/16	3 1/2	1 1/4	3 1/2 × 2 1/2*
15 to 17 15/16	4	1 1/2	4 × 3 *
18 to 21	5	1 3/4	5 × 3 1/2*

*Shaft sizes for these keys are not listed in American Standard B17.1—1943.

ALTERNATES XX

DIAMETER OF HOLES INCLUSIVE, IN.	KEYWAYS		KEY STOCK
	WIDTH	DEPTH	
1/2 to 9/16	1/8	3/64	1/8 × 3/32
5/8 to 7/8	3/16	1/16	3/16 × 1/8
15/16 to 1 1/4	1/4	3/32	1/4 × 3/16
1 5/16 to 1 3/8	5/16	1/8	5/16 × 1/4
1 7/16 to 1 3/4	3/8	1/8	3/8 × 1/4
1 13/16 to 2 1/4	1/2	3/16	1/2 × 3/8
2 5/16 to 2 3/4	5/8	5/32	5/8 × 7/16
2 13/16 to 3 1/4	3/4	1/4	3/4 × 1/2
3 5/16 to 3 3/4	7/8	5/16	7/8 × 5/8
3 13/16 to 4 1/2	1	3/8	1 × 3/4

XX It is recommended that these alternates be used only when conditions make it undesirable to use the sizes in the above table.

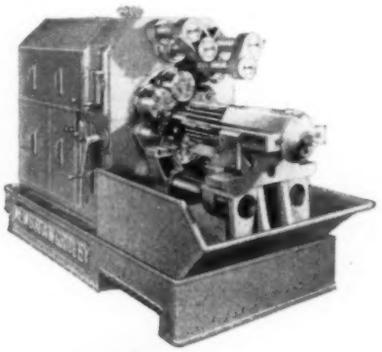


THIS MACHINE MORE THAN PAYS FOR ITSELF IN TWO YEARS

A progressive American manufacturer sought a better way to machine a large magneto housing which presented numerous difficulties. There are three different materials in the piece—aluminum die casting, steel bushing and liner, and brass spacer. The tapered hole in the bushing requires a fine finish and close tolerance. The inside diameter of the liners must also be closely maintained.

The housing was formerly turned out on four turret lathes at the rate of 28.8 per hour. New Britain engineers proposed replacing these four lathes with a single Model 695 New Britain Chucking Machine, with these results:

Regular production rate over a six-month period — 102 pieces per hour. Uniformity and over-all quality substantially improved and cost reduced. Operator fatigue practically eliminated.



ENGINEERING DETAILS

Fourteen tools are fed in by the main tool slide, and the fact that three different metals are cut at the same time makes the production rate outstanding. To produce the fine finish and close tolerance of the taper bushing hole, two boring, one counter-boring and two taper reaming operations are performed. Two roughing cuts and one finish operation are employed to assure high uniformity and good finish in machining the segment inserts.

New Britain

AUTOMATICS

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

NEWS OF METALWORKING

WAA Credits Fixed-Price Policy For Spurring Machine Tool Sales

WASHINGTON — Surplus general-purpose machine tools have been sold much more rapidly since the fixed-price plan went into effect, WAA officials claim. Most buying is being done by smaller shops, which could not afford to purchase new machine tools.

Some big buyers also are spending money for surplus machines to replace very old tools now in their shops. The claim is that this money would not have been allocated for new machines. One midwest manufacturer, for example, is purchasing machines with original value of $20 millions, and another company is buying $5 millions (based on original value).

WAA states that it has sold or is in process of selling sizable numbers of surplus machines to the original builders to be rebuilt. These are being sold at the fixed-price level.

Strategic Reserve Teams

Six teams have been created by WAA to pick out the 65,000 standard general-purpose machines which the armed services intend to retain as a strategic reserve. Each team consists of a procurement officer, a WAA machine tool man and two machine tool men from the services. Teams are to be assigned to the Detroit, Chicago, Cleveland, New York, Philadelphia and Cincinnati warehouses.

It is hoped that the number of teams will be expanded to 20. If so, the job can be completed in three months instead of a year. Machines tagged by teams will be shipped out of warehouses in 30-45 days, relieving the WAA storage situation.

Special-purpose machine tools are to be earmarked for the services too. Help of machine tool builders is being sought in this task. Two men are busy now in Washington screening the specials. All disposal of special machines has been halted until this screening process is completed and until the services get what they need. It is roughly estimated that the total strategic reserve of all kinds of machine tools will total 100,000 units.

Flow of School Requests

WAA further estimates that about 100,000 machine tools will be taken by educational institutions and prison shops at a nominal price—a 95% discount. Requests are said to have already been made for half that number of machines. For specialized instruction in schools, special machines can be obtained mostly from the air services of the Army and Navy. Incidentally, scrapping of specials would cost more than the scrap price itself would bring, hence it would be less expensive to keep specials than to scrap them.

Sales abroad of a considerable percentage of surplus machines is one of WAA's aims in its "25%-below-market" sales campaign. Up to this time surplus machine tool purchases here for shipment outside the country have amounted to about $30,000,000, original purchase price.

Plans Made for Scrapping

After all sales have been made that can be made to various classes of buyers, WAA feels that it will be stuck with about 150,000 surplus tools. The best thing to do then will be to scrap these unwanted tools. A plan is now being worked out for such scrapping.

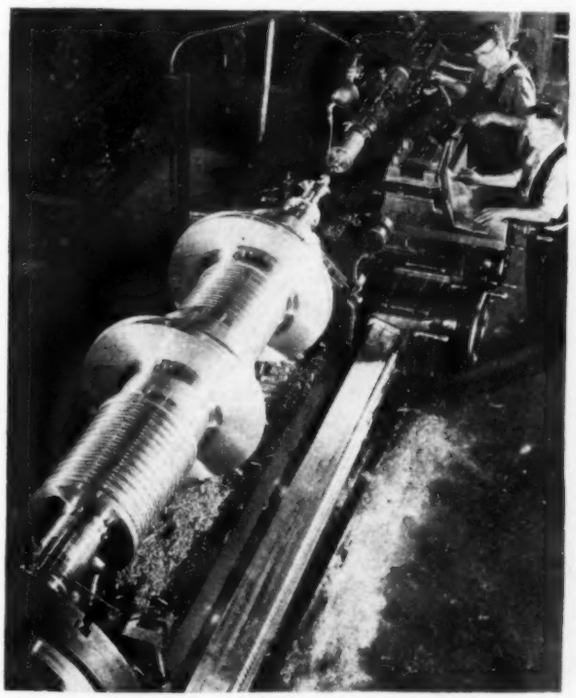
WAA hopes to clean up completely its task of machine tool disposal by or before the end of 1948. It believes that all the surplus machines which could possibly be a threat to new machine tool sales will be sold by next July.

The national inventory of metalworking equipment in possession of WAA on October 30, 1946, was $698,705,000 (exclusive of July and August). Sales made by approved dealers from January 1, 1946, through November 15, 1946, were $156,906,995. Total dollar value of sales by WAA salesmen was $284,271,000 (exclusive of July and August). Dealers sold about 55% of the total.

Steel Output Seen Topping '44 Record of 89,641,600 Tons

PITTSBURGH — Important steel management officials believe that, with the industry enjoying complete freedom from strikes, 1947 can be a record ingot year. These interests envisage steel production just topping the 89,641,600 net tons of the previous record year, 1944, with favorable labor conditions.

These predictions are interesting in view of expectation—participated in by many economists—that a business recession may develop during 1947. The idea is presented in the steel trade that it is possible for steel output to make its new peak in the face of some decline in output elsewhere.



New Turbine—Typical of several 4,000 to 7,500 kw high-extraction pressure turbines now under construction at Allis-Chalmers, Milwaukee, this 4,000 kw, 3,600 rpm spindle is part of a double, impulse-reaction machine for operation at 400 psig and 750° supplying process steam at both 150 and 5 psig

Gaging Business

Production Soars To New High

Production in the metalworking industries has soared to a new postwar high. The materials situation continues to ease here and there, and the lull in strikes has contributed to relatively uninterrupted output. Many manufacturers report that operations should climb slowly but steadily, provided that work stoppages do not occur. Strikes are the only possible development which may slow up activities the next few months.

Stringent Labor Shortage

Metalworking plants in many parts of the country are facing a labor shortage as stringent as that during the most difficult days of the war. A group of Chicago manufacturers, for example, report that by January 15 they will need an additional 30,000 workers. The Illinois State Director of Labor asserts that the chances of meeting this demand are very slight.

Machine Tool Business Spotty

New orders for machine tools continue to drag, though many individual cases are reported of very good business in December. The contrast between the activities of one builder and those of another is marked. Spottiness prevails throughout the industry. The situation in castings, bearings and electric motors is better, but still is reasonably tight. It is believed that industry shipments in December compared favorably with those in November, despite the coal strike and various shortages. Machine tool builders feel that a peaceable settlement of wage demands can be made on a plant-by-plant basis rather than on a national level.

Printing Machinery Makers Busy

Manufacturers of printing machinery look for a record output this year. Their backlogs are estimated at several hundred million dollars and will take 18 to 24 months to work off. Wartime obsolescence and depreciation of presses and other equipment, destruction of printing plants abroad, and a swing toward color printing are factors responsible for the huge current demand.

Motor and Generator Output High

Orders for large electric motors and generators are running about five times the average 1936 monthly figure. Unfilled orders are up from a year ago. Shortages of various materials, especially copper and magnet wire, have prevented manufacturers from catching up. It will be well into '47 before it will be possible for the industry to make a sizeable dent in backlogs.

Fractional horsepower motors are being made at a record clip. It is believed that orders on hand total at least 50,000,000 units, though there may be some duplicate ordering represented in this figure.

Appliance Output Hampered

Makers of household appliances are stepping up their operations and are expected to hit new highs this year. They still are plagued by shortages not only of motors, but also of steel. Range manufacturers, for instance, say that they will not be able to get into full stride until the third quarter because they cannot get more steel until then. Radio set makers are straining to raise their production above current levels, but thus far have been thwarted by various shortages.

More Steel Tonnage Promised

Just how much steel, particularly flat-rolled stock, will be available during 1947 is a matter of controversy. Steel mills say that the present tightness will be relieved as the year moves along, with the first relief coming soon. Big users, on the other hand, think that the tonnages will be considerably less than the steel industry indicates. They assert that delays in getting mill equipment will make it impossible for steel companies to put some of their new mills into production as early as scheduled.

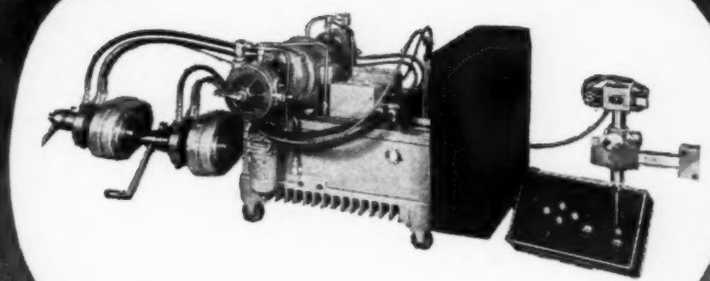
One point is sure: as the finishing mill tonnages grow, the demand for raw steel will become heavier. Steel furnaces are going to be pushed hard to supply the high tonnages required. Their only chance of keeping up with the demand is to be favored with peaceful labor conditions instead of work stoppages. Any interruption to steel production this year will have a particularly damaging effect upon metalworking operations.

Plastics Record Foreseen

The plastics industry is headed for a record year. Heretofore the chief trouble has been the lack of enough raw materials to meet the needs of fabricators. This situation will gradually be remedied as 1947 progresses. Both molders and laminators are anticipating a sharp gain in volume of orders this year compared with last. This will be on top of a healthy increase the past year. Installations of injection molding presses have almost doubled the last year or two, and huge orders still are on the books of equipment makers. Completion of expansion programs in basic plastic production will run well into 1948.

Atom-smasher X-ray — Soundness of the welded seams of the huge outer tank of this atom smasher is being tested by X-ray cameras, similar to those used in hospitals for cancer treatment. Cables in the background carry 140,000 volts to operate the X-ray tube. A 30-sec. exposure provides a picture that will show any flaw in the tank's seams. After its "physical," the atom-smasher will be put back in operation to hurl electrified particles at speeds approaching 100,000,000 m.p.h.

THE DUPLIMATIC



FORMERLY MANUFACTURED BY THE DETROIT UNIVERSAL DUPLICATOR CO.

NOW IS A PRODUCT OF THE LODGE & SHIPLEY CO.

EXCLUSIVELY FOR

LODGE & SHIPLEY LATHES

FOR CONTOUR TURNING AND CONTOUR FACING

The DUPLIMATIC is now being produced by the Machine Tool Division of The Lodge & Shipley Company for the exclusive application on the new Lodge & Shipley Lathes equipped at the factory.

With the DUPLIMATIC forming an integral part of their complete line of Lathes, Lodge & Shipley now offers a wider range of turning and contouring possibilities, and greater production at lower cost.

The DUPLIMATIC does not interfere with the use of the Lathe on regular single-piece jobs in the shop or in the Tool Room. Your regular lathe work, plus added versatility for step turning, contour turning and contour facing is a feature of the DUPLIMATIC.

Investigate its savings in your shop. Descriptive catalog matter will be available in the near future.

THE WORLD OVER · KNOWN FOR GOOD LATHES ONLY · L & S LATHES

THE *Lodge & Shipley* COMPANY

CINCINNATI 25, OHIO, U. S. A.

MACHINE TOOL DIVISION 3055 COLERAIN AVE. • SPECIAL PRODUCTS DIVISION 800 EVANS ST.

SAE Members Review New Motors At Meeting; Frudden Elected

DETROIT—Future design and production planning occupied members attending the 1947 annual meeting of the Society of Automotive Engineers at the Book-Cadillac Hotel Jan. 6-10.

Design and development of a four-cylinder automobile engine fabricated from steel stampings, steel tubing, and screw-machine parts was reported in further detail by Paul Klotsch of Crosley Motors, Inc. The engine was described as weighing 120 lb. with accessories, and producing better than 26 hp. at 5,200 rpm. The cylinder block contains 125 pieces, with copper in sheet, wire or paste form applied to every joint.

Slide-Valve Engine

Ralph L. Skinner of Skinner Motors, Inc., said a slide-valve engine eliminates poppet valves and resulting troubles, offers a power-weight ratio of one to four, and can possibly reduce car weights by as much as 800 lb. The slide-valve engine operates without detonation on lower-octane fuels, gives better performance and economy, and eliminates troublesome "hot spots."

Early but promising experiments with instrument measuring of motor coach structure loads and stresses were reviewed by H. E. Fox of GMC Truck & Coach Div., General Motors Corp. Borrowed from aircraft engineering, the technique might show the nature of stress cycles responsible for fatigue failures.

Synthetic O-Ring Described

David R. Pearl of Hamilton Standard Propellers Div., United Aircraft Corp., reported a new synthetic rubber O-ring, or "doughnut," seal can be made perfectly leakproof with static pistons and cylinders, for fluid pressures up to 5,000 lb. psi, temperatures between —60 to 250 F. He said the doughnut seal can be used not only in hydraulic mechanisms, but can replace flat surface gaskets under cylinder and bolt heads.

New Officers Elected

At a business session, C. E. Frudden, consulting engineer for the Tractor Div., Allis-Chalmers Mfg. Co., was elected president, succeeding L. Ray Buckendale of Timken-Detroit Axle Co.

The following vice presidents were named: Harold R. Harris of American Overseas Airlines, Inc.; James M. Shoemaker of Chance Vought Aircraft Div., United Aircraft Corp.; Carl T. Doman of Aircooled Motors, Inc.; Rudolph I. Schonitzer of Schonitzer Engineering Co., and George M. Lange of Fuel-Injection Div., Ex-Cell-O Corp.

Also John M. Campbell of Research Laboratories Div., General Motors; W. H. Graves of Packard Motor Car Co.; Stephen Johnson Jr., of Bendix-Westinghouse Automotive Air Brake Co.; B. G. Van Zee of Automotive Div., Minneapolis Moline Power Implements Co.; D. K. Wilson of N. Y. Power & Light Corp., and Schuyler A. Jeffries of Studebaker Corp.

B. B. Bachmann of Autocar Co., was reelected treasurer.

Rear-Engine Autos Scheduled To Roll Off Lines By April

CHICAGO—Preston Tucker, president of the Tucker Corp., hopes to have his new rear-engine automobile coming off assembly lines in the vast former Dodge-Chicago plant by the middle of April. Now that Tucker has won his Washington battle for possession of the plant (which the National Housing Agency wanted to lease to a prefabricated house manufacturer) he is pushing his production planning.

First working models of the radically designed aluminum and steel "Torpedo" will be completed sometime in February, it is expected. The company expects to convert the plant, which turned out thousands of aviation engines for war use, with comparatively little difficulty. Even the conveyor system needs only slight changes.

Steel Planned for Body

The Tucker firm says it has lined up suppliers in the Chicago area, even for such scarce items as batteries. Aluminum will be used in the hood, bumpers, engine block and crank case. Most of the body will be steel. A new electrical method of paint application will be used on the car bodies.

The Rock Island Railroad plans to buy two test suburban trains, of extreme modern design, from Pullman-Standard Mfg. Co. and Fairbanks, Morse & Co., in a move that may inaugurate use of diesel power and streamlined coaches in suburban rail service. While one or two lines are already experimenting with diesels in commuter service, the Rock Island's program is believed to be most comprehensive.

PIPE PRICES INCREASED; RISE EXPECTED FOR PLATES

PITTSBURGH—Pipe is one of the latest steel products to be increased in price. The leading producer increased oil country tubular goods $6.50 per ton; seamless standard and line pipe $7.30; and buttweld $9.

An increase of $8 per ton in bright wire is not yet general but is headed that way.

With prior price upturns, these developments leave but certain lines of semi-finished steel and plates and shapes unchanged at the time of this writing. It is still expected that ultimately shapes and plates will be raised $5 per ton.

Plate and shape mills are at least three months behind, but some new shape business is being held up pending complete revision in construction controls and further indication of how extensive price declines may be in other types of building materials.

South American Welcome—James F. Lincoln, president, the Lincoln Electric Co. (extreme left) is shown being greeted by G. M. de Menezes of Rio de Janeiro, in his tour of Pan-American industry. R. A. Edwards, manager of distribution, Armco International Corp., is shown third from left. Mr. Lincoln returned during the holidays, enthusiastic about Latin-American industry

Now you can cut

YOUR THREAD MILLING COSTS, TOO

... with M-11

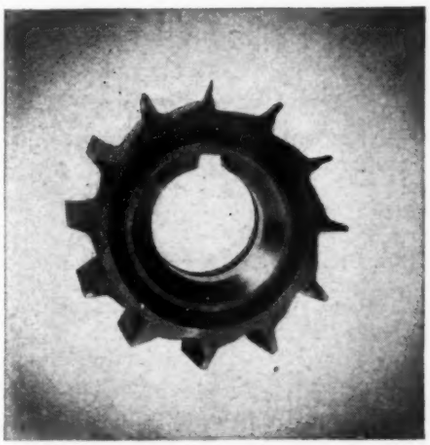
"M-11", Detroit Tap and Tool Company's exclusive chrome-cobalt high speed steel enables us to offer you standard and special thread milling cutters having:

1. Higher impact strength. Less chipping or accidental breakage.

2. Greater abrasion resistance — more life between grinds.

3. Higher red hardness. Ability to run at higher speeds.

4. Greater uniformity throughout the cutter. Consistent performance, grind after grind.



. . . after 18 sharpenings

The cutter shown here, for instance, has cut two sets of 12 pitch threads, 4" and 6⅜" diameter to close tolerances on 10,000 parts of SAE 1035 steel. It has had 18 grinds and was still cutting precise threads, 16 hours a day.

What's more, "Detroit" thread milling cutters are easy to order. Most widely used types and sizes are carried in stock, ready for thread grinding to your specifications.

You can order them by number. Ask for Catalog Sheet CB-45.

GROUND TAPS
•
THREAD MILLING CUTTERS
•
THREAD GAGES AND SPECIAL THREADING TOOLS, MACHINES AND CHECKERS

DETROIT
TAP & TOOL CO.
8432 BUTLER AVE. • DETROIT 11, U.S.A.

•

M-11 IS NOW ALSO AVAILABLE EXCLUSIVELY IN TAPS, THREAD ROLLS AND PLUG GAGES MADE BY DETROIT TAP AND TOOL.

Detroit Letter

Spotlight on Portal Pay

Portal pay is the large issue of the moment in industrial areas throughout the country, but concern over it is perhaps more widespread in Detroit, because—like many another labor development—it had its origin here. And its ultimate determination is also being shaped in Detroit, where the amount of compensable extra time is under consideration in the precedent case, brought against Mt. Clemens Pottery Co.

Legal minds have some doubts whether all-inclusive determinations can be made in the Mt. Clemens case. The unworked time which must be paid for differs in most plants, not because of such factors as minutes spent on company property before the work station is reached, but also by reason of the specialized preparations required for various jobs. One may require special clothing from the skin up; another may need only a pair of leather gloves.

Few Findings Applicable

Obviously result will be that few findings in the Mt. Clemens pottery case, perhaps none beyond the principles involved, can be applied to other situations. The way is thereby opened to argument and court suit—or to bargaining. Both labor and management may be able to use the issue as a weapon to influence demands made by the other.

One good example of portal pay being used as a bargaining ace was at Dow Chemical Co., where the AFL United Mine Workers Union recently waived its demand for a blanket pay raise (settling for a not-too-significant advance in the plant starting rate) in return for a retroactive portal pay settlement which just about balanced its original demand for a one-year period. The company felt it would be held liable for the retroactive money and was satisfied that it made the best deal possible by obtaining a waiver on the union's blanket wage demands. Similary, District 50 officials were quite content to report to their membership with flat portal payments in lieu of advances which would be spread through the forthcoming year.

Effect Somewhat Exaggerated

Auto companies are not quite as concerned with portal pay as the newspapers have made out, although, naturally, there is not the slightest bit of underestimation of the situation. Most of them feel they will come within the *de minimis* principle, which holds that inconsequential fractions of time preliminary to and after the job cannot be counted. Some exceptions to this position may crop out at Ford and other large plants where the gates are far removed from some operations, but they will be the exceptions rather than the rule. Special preparations for jobs in the mass production auto companies are not typical. Still most companies are looking at the situation from all angles.

British Mounted Plough—A new light-weight, compact, agricultural implement, which was recently demonstrated in farmland in Essex, is being produced jointly by Ford Motor Co., Ltd., Dagenham and Ransomes, Sims and Jeffries, Ltd., Ipswich. Screw handles for control of depth and furrow width on sidelands are within easy reach of the operator as is the levelling box in the off-side link

SCREW MACHINE PRODUCTS TIGHT AS RESULT OF STRIKE

DETROIT—On the shop side, the first shortages accruing from the coal strike are being noted. Screw machine products are somewhat tighter than they were, echoing the shortages of bolts, nuts and screws which prevailed through last summer.

Some tightening is also reported on the related product, cushion spring wire. But tie-ups on hot-rolled sheets caused by the coal strike are not expected for a few weeks yet. The net result has been to cut back projections modestly for January auto output; and this will give time for other scarce items to accrue.

Body solder, with its lead base, has continued hard-to-get, and one company is doing some interesting experimentation aimed at getting around this shortage. Low melting point alloys of unspecified content are being tried out as joining and filling material, applied by brazing, using a regular oxy-acetylene torch. Up to now, the testing is satisfactory.

23.5¢ Demand Overshadowed

With the emergence of portal pay to talk about, less is being heard on union wage demands which have been scaled at 23.5¢ by the United Auto Workers Union. But UAW has not lost sight of this main objective, even though it is talking much more about portal pay recoveries. In the three-story headquarters of the union, across from the General Motors Bldg. in Detroit, all hands are hard at work preparing briefs and exhibits which will demonstrate that 1947 will be a year of unheard of profits for automobiles, and that wage raises are greatly overdue. This revival of the "ability to pay" theme heard during the GM strike is somewhat incongruous in an industry which has yet to get into respectable profit position since the war, but it will be heard, and often, in the near future.

Living Costs Watched

Auto men, meanwhile, note with considerable interest the decline in food prices of late December, and the clearance sale prices which burst out in pre-Christmas sales displays like smallpox pustules. If the sharp drop in retail sales carries into the new year and lowers the cost of living index, the cries from labor for a living wage will suddenly seem far-fetched. Labor realizes this today perhaps more than management.

NOW A MOLDMAKER'S TOOLROOM LATHE WITH A PLUS FOR PLASTICS MOLDMAKERS

A complete range of lead variations—you can set your machine for any one of them in exactly one and one-half minutes!

Compare that performance with a normal toolroom lathe's—and change gears requiring thirty minutes to change. Think what you'll save on production time—and on original investment in change gears, too—especially if any sizable share of your production is thread molds for plastics.

Principal among the patented features of this new Monarch moldmaker's toolroom lathe is the adjustable leadscrew variating mechanism—a device that makes it a simple matter to compensate for the shrinkage of the material to be molded. Plastic thread molds become a mere routine production operation.

Then there's a speed-reducer—that permits slowing down to a *fraction of a revolution a minute* for internal and external milling operations, performed at a single setting of the mold in the lathe.

Add to these the features built into every Monarch toolroom lathe (and the machine is equally adaptable for normal toolroom work)—features that have a proved record for precision and long life. The result is a machine you can't afford to be without if you have any plastics production. Like more facts? Ask for specification sheet 405—or call your nearest Monarch representative.

ACCURACY · ECONOMY · LONG LIFE
Monarch
TURNING MACHINES

THE MONARCH MACHINE TOOL CO. • SIDNEY, OHIO

Murray's Gains for Steel Workers Will Form Wage Demands Pattern

WASHINGTON—Is industry facing a repetition of last year's record-breaking strikes? The general opinion among those in Washington who think they can read signs is "no."

This feeling became strongest after the Government made John L. Lewis say "uncle" for the first time since before the war. Lewis' capitulation by calling off his strike of soft coal miners against the Government is believed by many to indicate a turning point in the country's labor situation.

It was stimulated, of course, by the Republican victory in November and its significance in new labor legislation now under consideration by the 80th Congress.

It is no secret, either, that last year's stoppages took the wartime bulge out of union treasuries and workers' savings, while at the same time helping to push prices up.

Steady Production Cited

Even the Nathan report, which the CIO had prepared to support its drive for "substantial" second-round wage increases, recognizes the need for steady production. While asserting that "total corporate business" can pay a 25% wage increase out of profits, the report warns: "It is most important that this general wage advance be achieved without crippling work stoppages."

CIO economists are reported to have advised CIO leaders that they better win this year's wage increases without strikes.

Whatever the reasons behind it, the fact is that the CIO is moving slowly, cautiously. The strategy is carefully planned.

No Strike Drum-Beating

There is no jumping the gun like Walter Reuther's UAW-CIO strike against General Motors which lasted 113 days. No drum-beating for strikes—no ultimatums.

CIO President Philip Murray has picked up the ball that Lewis fumbled. Consequently, the pattern of second-round wage increases in mass production industries will be determined largely by what Murray gets for his steel workers in negotiations just begun with some of the basic steel companies. CIO signals call for Murray to lead the way, with the auto and electrical workers following close behind.

Murray Seeks 'Offer'

In asking for a "substantial" wage increase, Murray in effect is asking the steel industry to "make an offer." He has avoided a demand for a specific amount. The same approach will be made by the CIO Electrical Workers. Apparently for internal political reasons, the CIO Auto Workers have come forward with a specific demand for 23.5 cents more in hourly rates.

As usual there are other so-called "fringe demands." This year considerable emphasis is being placed on "social insurance," a guaranteed annual wage and gate-to-gate pay.

Westinghouse to Expand Buffalo Operations Beyond Motor Lines

BUFFALO—The Westinghouse Electric Corp. will expand its manufacturing activities in Buffalo this year to include lines other than electric motors, Bonnell W. Clark of Pittsburgh, vice president in charge of sales, disclosed here. He indicated the new lines will be kindred to motor production.

Despite strikes and shortages which have plagued industry, the Motor Division plant here is ahead of its production schedule, Mr. Clark said. It turned out approximately 11,000 motors in December, a new high for the plant.

He said the entire Motor Division is being moved from East Pittsburgh to Buffalo as quickly as possible and the transfer should be completed this year. Various types of motors produced by the division range from 1 to 200 hp. The plant hopes to turn out 25,000 motors a month by the end of this year.

Mr. Clark said the plant is still feeling effects of the two-week coal strike and has been running close in its use of steel.

Bargaining in Metalworking Will Reflect Steel Action

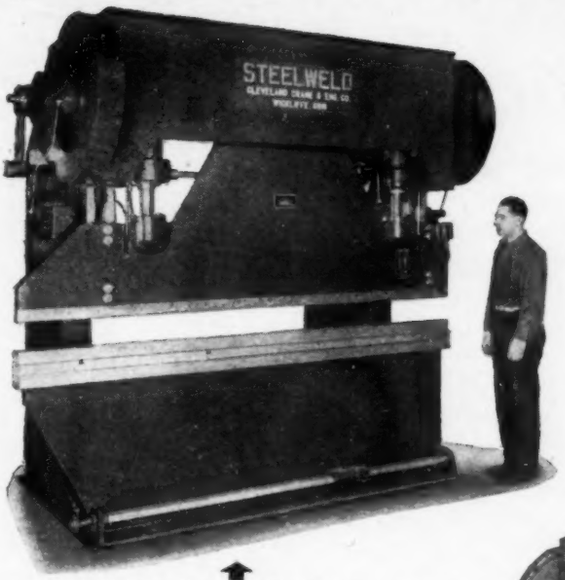
WASHINGTON — Despite CIO talk of letting the facts in each industry determine the amount of wage increase, employers in metalworking industries will have to do a lot of selling to get by with any wage increase that doesn't come up to what Philip Murray gets from basic steel.

There will be even less chance of deviation from the "pattern" within the individual industries. In letting Murray carry the ball, CIO leaders were not unmindful of the fact the steel industry is in a much better profits position than either automobiles or electrical manufacturing.

They're looking for Murray to come out of the steel negotiations with a good-sized increase which steel fabricators and manufacturers of electrical equipment, automobiles and parts may have to match if they want to avoid strikes.

Employees of The Fellows Gear Shaper Co. had good reason to celebrate during the holidays. E. W. Miller, vice president and general manager, is shown at right distributing Christmas bonus checks as the firm marked its Fiftieth Anniversary

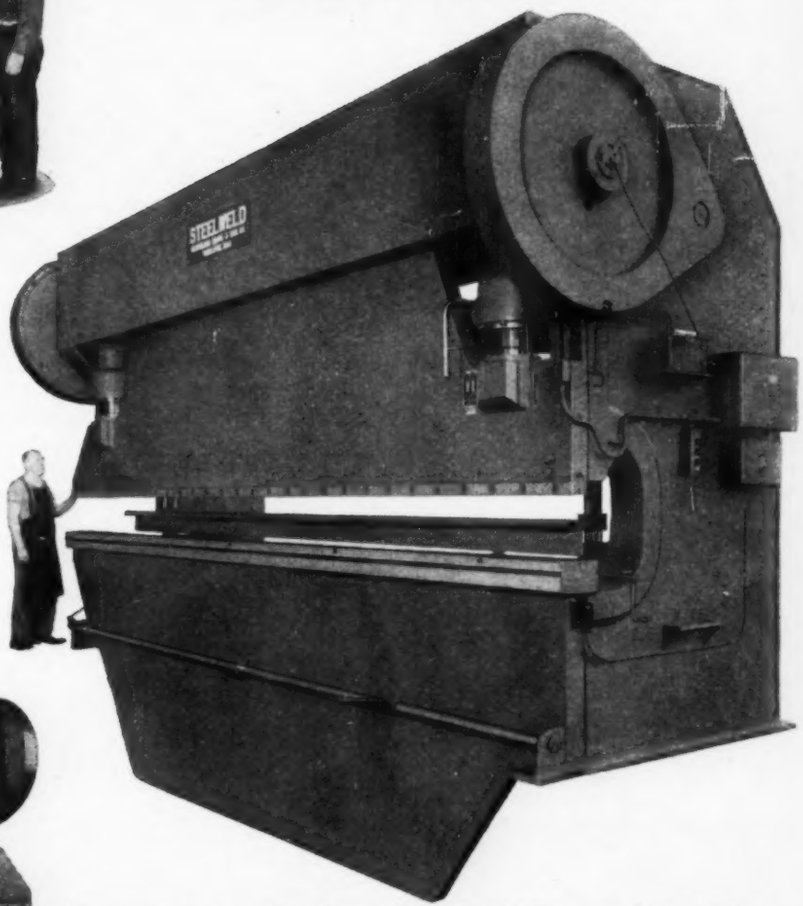
CHOOSE THE PRESS THAT BEST SERVES YOUR NEEDS



MODEL F3-6 handles plate 6' x ¼" between housings and 9' x $\frac{3}{16}$" over entire length of bed and ram. Has 1'-0" extension on left end.

MODEL J4½-16 bends cold steel plate up to 19 x $\frac{3}{32}$" or 8' x $\frac{3}{16}$". Because of distance between housings, bed extends below floor to assure straight, accurate bends.

MODEL H3½-8 for braking, forming and punching plate 8' x $\frac{5}{16}$" between housings and 14' x $\frac{3}{16}$" over entire length of bed and ram. Provided with 2'-0' extension on each end.



There is a complete line of Steelweld Presses that can be furnished with many features to best suit your requirements. These include bed and ram extensions, special bed widths, various speeds, two-speed gearing for high and low speed, reversing flywheel for instant reversal of ram in any position of stroke, electrically-operated clutch and brake, tonnage indicator that registers press loadings, and other features.

Many other Steelwelds are available for plate of thickness to one inch.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

1401 East 281st Street, Wickliffe, Ohio

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

Washington Bulletin

Bids Asked on Abrasives

About $15,000,000 worth (acquisition cost) of surplus abrasives will be sold under competitive bidding by the War Assets Administration. The stocks consist of cloth-backed sticks, stones, hones, etc. in various sizes, and all natural and synthetic crude and manufactured products excepting natural carbon (industrial diamonds), and grinding wheels. They are offered in lots not less than $1000 (cost), principally at WAA warehouses in industrial centers. Reserves are set aside for priority holders.

RFC Becomes Target

Not a few Republican Congressmen and some Democrats are dubious about RFC's suggestion to the President that its lending powers be extended indefinitely after legal expiration date of June 30. There is strong opinion on Capitol Hill that RFC's capital and credit powers, created in depression and war years, are no longer needed. Opposition to the extension will admit that if big business is entitled to federal financial aid, so is little business, but they will deny that either can be longer justified. Because of its long-term commitments, termination of RFC's lending powers would take years, but could be done by the Treasury.

Surplus Bearings on Sale

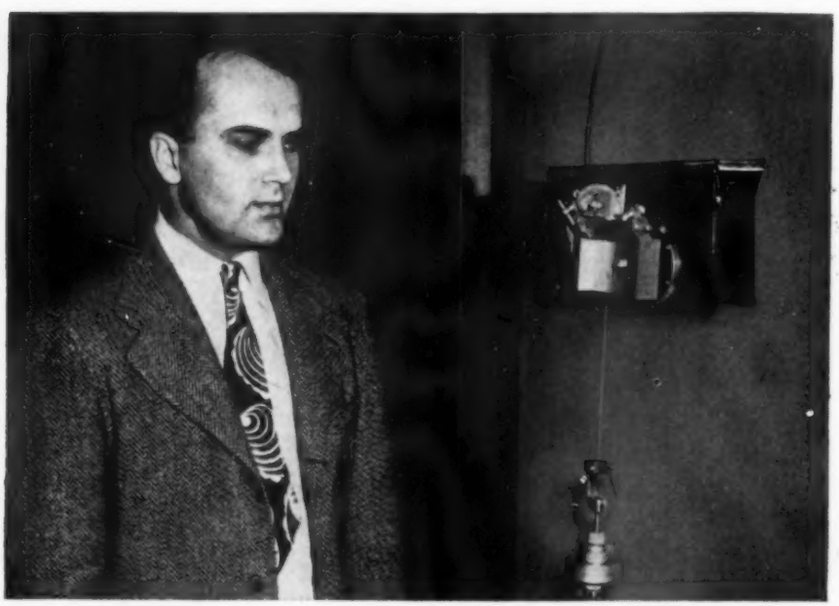
War Assets is offering for sale at once, on a bid basis, $24,000,000 (cost) worth of ball, roller and sleeve bearings, of many sizes—including some special automotive types. Regional offices are pressing sales through sealed bids, but if this proves slow they will turn to spot bids. Lots will be cut down to small-buyer size. Stocks are concentrated at industrial centers. Industry has already bought $8 million worth of bearings from WAA at fixed prices.

Army Surplus Disposals

The Army itself disposes of surplus generated by contract terminations, instead of declaring it to WAA. This surplus consists of government-owned tools, equipment, and property which have been used in war production by private contractors. Contractor has the first opportunity to buy these goods, by offering a "fair" market value. About $3 billion worth of contractor inventory has been disposed of. Army's total disposition of surplus now approximates $21 billion, of which $7 billion have been disposed of directly, and $14 billion through disposal agencies, mainly WAA.

Freight Car Order

Office of Temporary Controls (old CPA) gives a boost to production of domestic freight cars by ordering that no builder can place orders for steel to be used in exported cars, on orders he may have received after Nov. 30, unless the builder has OTC authorization. Application for permission to order steel to be used on export cars should give complete export and domestic car production schedules; tonnage of steel on hand; additional tonnage for which authorization is requested; effect on domestic production if requests are granted.



Wire Tester—Longitudinal fissures, cracks, improper crystal structure in fine tungsten wires cause premature failure of lamp and radio filaments. By stressing a few feet of wire in this instrument, an unskilled worker can tell whether the spool contains good or defective material. The instrument shown with its inventor, D. W. White of Sylvania Electric Products, Inc., may be licensed to manufacturers having similar problems with fine wires other than tungsten

WAA Puts Surplus Cutting Tools On Competitive Bidding Basis

WASHINGTON—The $58,000,000 inventory of government-owned surplus cutting tools has been switched from an agency sale basis to a competitive bid basis. About 198,000,000 pieces are concentrated mostly in War Assets warehouses at Detroit, Cleveland, Cincinnati, Chicago, New York, Philadelphia, and Boston, but most WAA regional offices will have some stocks on hand.

The tools are of 26,000 different sizes. They include twist drills from 0.0135 to 4 in.; reamers from 0.0 to 4 in.; milling cutters from 0.015 to 12 in. Stocks are in three categories: new unused standard catalog items in original manufacturers' containers; new standard catalog items not in manufacturers' containers; and used tools and special-purpose items used and unused.

Months ago a Congressional committee strongly criticized several agency agreements for the disposal of surplus property, including that on cutting tools with about 40 cutting tools manufacturers. The Committee claimed that the manufacturers were making little or no effort to sell the surplus stocks returned to them, meanwhile pressing sales of their new production.

Under the agreement, stocks were returned to the manufacturers who were to segregate special and single-purpose items from standard items. Of the manufacturers' total sales, 25% were to be surplus standard tools. The manufacturers received 17½% commission on their surplus sales.

War Assets, in announcing the shift to competitive bidding, says that annual new cutting tools production has reached a level of about $100,000,000 annually, and that sale of the surplus inventory, which is about a half year's supply, will cause no great impact on the industry.

Surplus stocks are being offered in lots of not less than $5,000 (acquisition cost). It is estimated the inventory contains about $17 million worth of special and single-purpose tools.

PIERCE and NOTCH at the same time

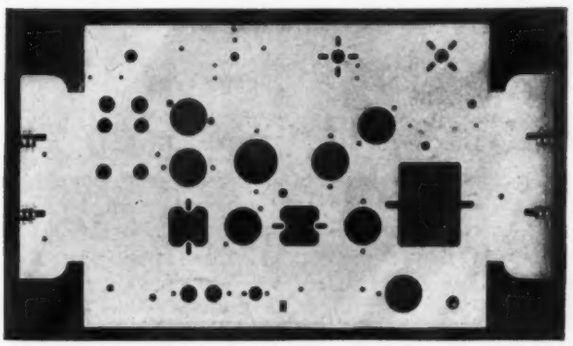
A typical set-up for notching and piercing.

with

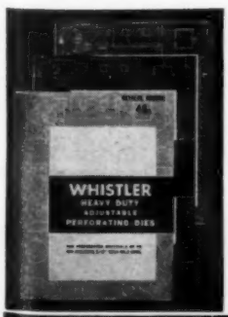
WHISTLER

MULTI-USE Adjustable Dies

Pierced and notched with Whistler multi-use adjustable dies.



You save press time and speed production by combining corner notching dies and group dies in the same set-up with adjustable piercing dies. Press operations are reduced to a minimum. Engineering changes effecting relocation or sizes of holes can be made without delay right on the press.



Whistler multi-use adjustable dies are available from stock... a day or two from your plant ...in all standard sizes from 1/32" to 3" diameters... round, square, ovals and rectangles. Notching and group dies to order. In addition to mighty attractive savings in original die costs there is this important advantage of eliminating weeks of production delay.

Re-arrange Whistler multi-use adjustable dies in as many different set-ups as your production calls for... you actually make up die sets from units in stock and reduce costs per job to an unbelievably low figure. All parts of like size are interchangeable.

Get all the facts on how Whistler adjustable dies can speed *your* production... cut *your* costs. Write today for the Whistler Catalogs.

S. B. WHISTLER & SONS, Inc.
752-756 MILITARY ROAD BUFFALO 17, N. Y.

WHISTLER MULTI-USE ADJUSTABLE PERFORATING DIES

Foreign Report

BASED UPON REPORTS FROM THE MCGRAW-HILL WORLD NEWS BUREAU

U. S. Companies Sign Agreements To Supply Machine Tools to China

SHANGHAI—Seeking to get a big foot, and the first American foot, in the China machine tool market, William Hunt & Co. has arranged exclusive agency agreements with 13 U. S. manufacturers.

These agreements, generally covering 3-year periods, have been concluded with The Bullard Co., Barber Colman Co., Buffalo Forge Co., Hanchett Manufacturing Co., Oilgear Co., V. & O. Press Co., Cleveland Automatic Machine Co., R. K. LeBlond Machine Tool Co., National Automatic Tool Co., Fosdick Machine Tool Co., Gallmeyer & Livingstone Co., Jones and Lamson Machine Co., and Giddings & Lewis Machine Tool Co.

Strang, Root Named

The machine tool section will be headed by Ralph Strang, former European representative for several U. S. machine tool builders including Kearney & Trecker, and V. A. Root, previously export manager for Rockford Machine Tool Co. In addition, several sales engineers, including some Chinese now in training at U. S. machine tool plants under International Training Administration auspices, will be on the Hunt payroll.

Figuring on a minimum business of $500,000 per year at the beginning, Robert Barnum, company president, estimates his firm can do an annual machine tool volume of $2 million. If China begins a five-year industrialization plan, the volume could be several times this figure.

Strang and Root were scheduled to come to China, but Root will stay in the U. S. for several months to coordinate activities. Strang is expected to start operations the latter part of this month.

Australia Awaits German Tools

MELBOURNE, AUSTRALIA—Several thousand pounds of German machine tools, representing the first consignment of Australia's share in the initial allocation of industrial reparations is in transit from Germany to Australia.

Biggest item awaited in Australia is a 5,000-ton forging press weighing 3,000 tons. No decision has been made yet on the disposal of the plant or its industrial use in Australia.

Tata Plans Large Plant

BOMBAY, INDIA—Plans for a large and modern machine tool factory are being framed by Tata Industries, Ltd. It will be an expansion of Tata's Investa Machine Tools & Engineering Co., Ltd., a war baby now producing standard lathes and drill presses of Grade I accuracy at a rate of 25 each per month with a total of 550 workers.

A 100,000 sq. yd. site is sought in a Bombay industrial suburb, 30,000 sq. yd. of which will be in actual shop. Tata research department will survey machine tool requirements in India and the East and the factory will then specialize on this basis. Only power tools will be made.

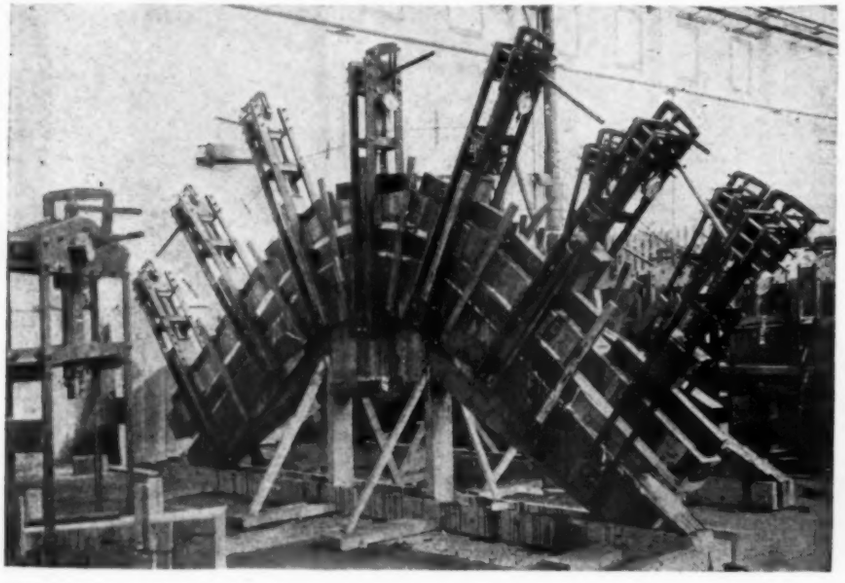
Bids to be Asked

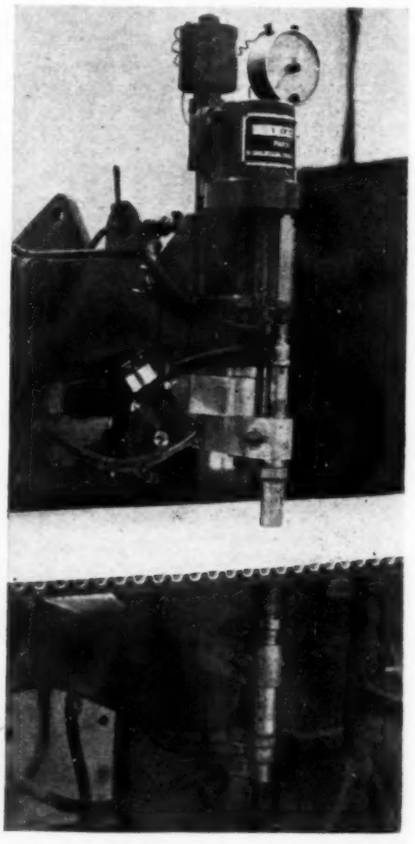
In about six months, factory planning experts and machinery suppliers throughout the world will be asked to submit proposals and bids on a general outline of specifications and requirements. Actual construction will start in about a year from now.

Machine Tools in Demand

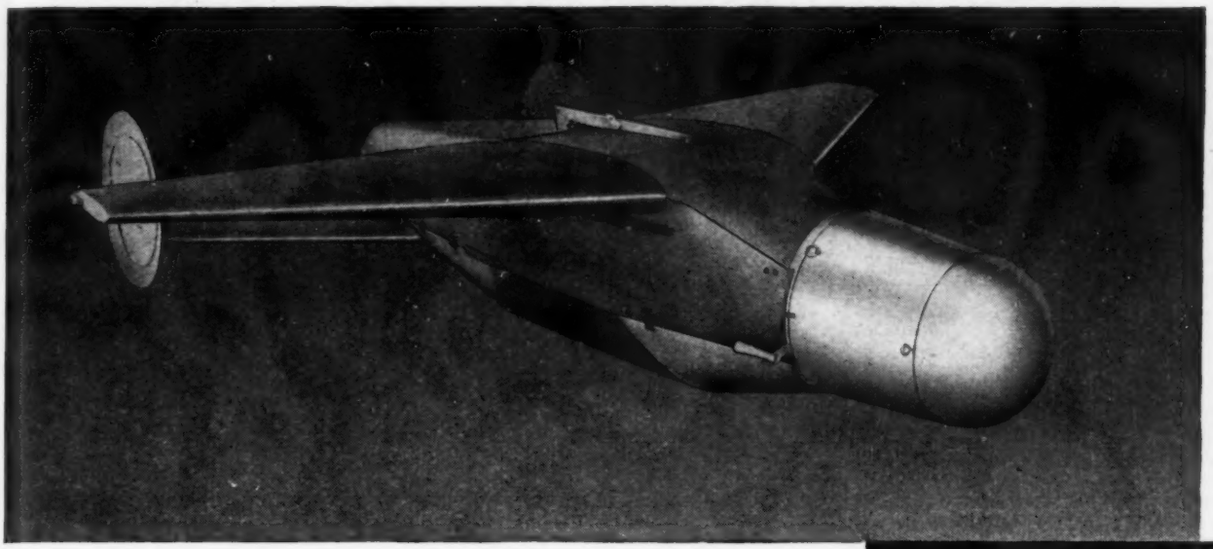
Meanwhile the demand for machine tools continues great in India. Indicative is the fact lathes produced for the Government during the war at a contract price of $1,800 now are being offered by the Surplus Disposals Directorate at $3,300 with plenty of takers.

French Aircraft Design—French VG-70 turbojet plane has all-wood wings at 38° with fuselage. Two spars, running the wing's length, are assembled of 1/4-in. plies with cold-drying cement. Plies are assembled and cemented under hydraulic clamps shown below, cut through lengthwise in 1/4-in. strips, twisted to shape and recemented. The VB-10 French fighter has double-layer wing skin (right). Outer is conventional, the inner ribbed and both are spotwelded. Electrode points are enlarged 1 cm. (0.39 in.) to assure wing smoothness





The secret weapon no Jap ship could dodge



Story of the NAVY BAT*. . .

Could a way be found to penetrate enemy anti-aircraft fire . . . and blow each Jap ship to bits . . . *without* losing our pilots?

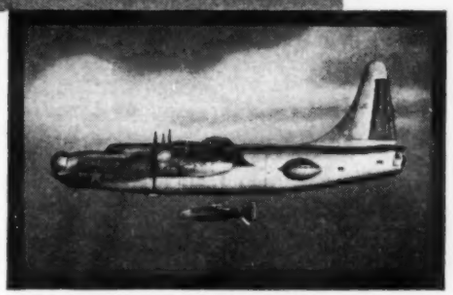
That was the urgent question. And American genius answered with the Navy Bat—a radar-guided glider bomb.

Designed to glide silently at 300 miles per hour—with a 1,000-pound bomb in its belly—the Bat was carried by a Navy patrol bomber.

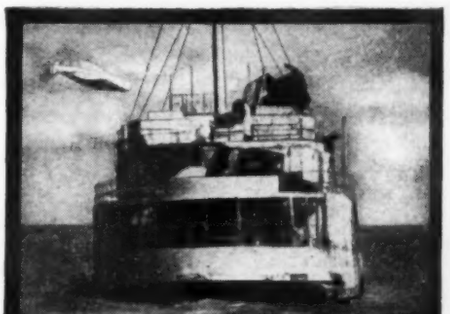
At a point five miles from the target, the "mother" plane would aim the Bat at a Jap ship and release it. From then on the Bat automatically followed every twist or turn of the enemy ship—and smashed into the dodging Jap.

Used against Jap destroyers, tankers, picket boats—and land installations—this weapon was so effective the enemy thought we had a suicide pilot inside each Bat.

Instead, the Bat contained revolving radar gear to search for the target —and tiny gyroscopes to correct for errors in flight.



"Mother" plane—five miles from target—aims the Bat, releases it, and turns away from enemy anti-aircraft fire. Bat glides ahead.



Automatically following every change in course of enemy ship—the Bat hits the target. First such weapon successfully used in combat by any nation. (**Sponsored by U. S. Navy Bureau of Ordnance and Bureau of Standards, the Bat is 12 feet long, has a 10-foot wing span. Official U. S. Navy photographs.*)

. . . and its 36 BALL BEARINGS

The men who developed this marvel knew that every Bat had to hit its target. They designed special guiding mechanisms. They made them sturdy, trouble-free, delicately responsive. They mounted the moving parts in 36 BALL BEARINGS.

New Departure ball bearings can be mounted in any position. They hold moving parts precisely in place—with unchanging accuracy—under every kind of load. They move with less friction than any other type of anti-friction bearing.

In the Bat—and in many other kinds of mechanized war materiel—375 million New Departure ball bearings helped our fighting men.

Today, millions more of these precision-made ball bearings are helping America at peace. By increasing production—by cutting costs —by serving industry in every field.

nothing rolls like a ball

NEW DEPARTURE
forged steel
BALL BEARINGS

3460

NEW DEPARTURE • Division of GENERAL MOTORS • BRISTOL, CONN. • Branches in DETROIT, CHICAGO, LOS ANGELES and Other Principal Cities

Names in the News

Joseph Johnson Serving First Term as Vermont State Senator

SPRINGFIELD, VT.—Joseph B. Johnson, vice president and general manager of the Bryant Chucking Grinder Co., is now serving his first term as State Senator in the Vermont legislature. He was elected Nov. 5 for the 1947-1948 term. He was State Representative in the legislature from Springfield during 1945-1946. Mr. Johnson is the second machine tool executive from Springfield to be successful in politics at the November election, Ralph Flanders having been elected United States Senator from Vermont at that time.

Well-known throughout machine tool circles, Mr. Johnson came to this country from Sweden when one year old. Since 1902 he has lived in Springfield, where he attended high school. He is a mechanical engineering graduate of the University of Vermont and has been associated with the Bryant company since 1915. He advanced from draftsman to designer to chief engineer and finally to vice president and general manager in 1939.

Mr. Johnson is active in many civic, engineering and educational organizations. He is chairman of the board of trustees of the University of Vermont and since 1931 has been chairman of the school directors of Springfield. He also is a vice president of the Associated Industries of Vermont.

Machines Shipped By Air

CHICAGO—A shipment of machine tools by air cargo was recently completed by a Chicago Heights manufacturer, the Canedy-Otto Mfg. Co. The company makes drill presses, many of the small home workshop size, and sent a 7,000-lb. shipment to a New York distributor.

For rush orders, speed warrants the extra freight cost, the company said. With a backlog of orders that will take 18 months to fill, the firm expects to make extensive use of air cargo.

W. H. Lantz, Jr. and **Rey F. Frenger** have been elected vice presidents by Federal Electric Products Co., Newark, N. J. Mr. Lantz will be executive head of the Hartford, Conn. Div., while Mr. Frenger will be in charge of the Wm. Wurdack Div., St. Louis.

H. W. Mons has been elected president of the Hill-Clarke Machinery Co., Chicago, to succeed **A. W. Wigglesworth,** who has been named chairman of the board. **W. R. Ditfurth** has been named vice president and treasurer.

George D. Keller, former vice president of Studebaker Corp., has been elected president of the Bobbi Motor Car Corp., Birmingham, Ala. Also, **Robert T. Haney,** former head of Haney Motor Co., Inc. and Haney Corp. of Philadelphia and Colorado Springs, Colo., has been elected a director and vice president in charge of sales.

Thomas L. Hibbard has been named director of styling of the Ford Motor Co., Dearborn, Mich.

R. G. Willaman has been named vice president and sales manager of Peterson Steels, Inc., New York City and **D. B. Hassinger** has been promoted to secretary and New York district sales manager.

A. L. Atherton, executive vice president of Morley & Associates, Seattle, has been elected vice-president of American Chrome & Magnesium Products, Inc., New York City.

Lee C. Daniels has been appointed chief engineer of Towmotor Corp., Cleveland.

Research on Forged Parts

CLEVELAND—A research program that will result in reduced cost of forged parts is being conducted by the Drop Forging Association it has been announced by Raymond M. Seabury, secretary.

Headed by Prof. John M. Lessells, the researchers are studying the properties of die forgings, compiling comparative data on properties of forged and cast materials, compiling basic data for forging die design, and making other investigations. Results of the research program will be made available through technical papers, articles and bulletins.

G. C. Reifel

J. J. Domonkos

George C. Reifel has been named vice president in charge of manufacturing at The Packard Motor Car Co., Detroit. He joined Packard in 1913 and served as superintendent of the Liberty aircraft experimental engine division during World War I and from 1939-1942 he was manufacturing superintendent of the car and marine divisions.

Julius J. Domonkos, manager of Bell Aircraft Corp's. Burlington, Vt. Div., has been elected a vice president of the company. He joined Bell ten years ago and has filled many positions including that of works manager of the firm's Marietta, Ga. plant.

Harry G. Leighton, who has been in charge of the Philadelphia office of Browne & Sharpe Mfg. Co., Providence, R. I., for 32 years has retired.

Donald S. Fitz has been named purchasing agent of the Landis Machine Co., Waynesboro, Pa.

Vere B. Browne retired Jan. 1, as vice president and technical director of the Allegheny Ludlum Steel Corp., Pittsburgh. He will become honorary vice president and be succeeded as technical director by **Frank B. Lounsberry.**

Charles Knupfer, senior vice president, **T. B. Foot,** assistant secretary, **George W. Chroamann,** associate manager of the Engineering & Product Development Div., and **George H. Huntley,** advisor to the planning department, retired from the Carborundum Co., Niagara Falls, N. Y., on Jan. 1.

Paul R. Pollock has been named manager of the Denver, Colo. office of Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Harry Dallas has been named resident engineering manager of Ellinwood Industries, Los Angeles, in the Seattle area.

Compact design...

can streamline appearance, increase operating efficiency, cut costs of material, handling and shipping. Your product may benefit by a product-design improvement which

Saves space and weight.

Through the use of Torrington *Needle* Bearings you gain many advantages. In addition to compact design, Needle Bearings have high unit capacity; have low co-efficient of friction; are efficiently designed for lubrication; are easy to handle and install; and are not only low in initial cost but promote many other economies in production and in service.

Just write us, outlining your problem and we'll be glad to work with you in selecting the right type for your requirements.

THE TORRINGTON COMPANY

TORRINGTON, CONN. SOUTH BEND 21, IND.

Offices in All Principal Cities

TORRINGTON BEARINGS

• NEEDLE • SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • BALL •

Robert B. Semple has been named director of Monsanto Chemical Co's. general development department. Also, **Carl F. Graesser** has been appointed sales manager of thermosetting molding materials for the company's Plastics Div.

John T. Foley has been appointed sales representative for the Corbin Screw Div., The American Hardware Corp., New Britain, Conn., in western Pa. and eastern Ohio.

Thomas S. Jones has been appointed manager of the Otis Elevator Co's. Buffalo, N. Y. works to succeed William E. Van Horn, who has retired after 40 years with the company.

Evert Carlmark has become plant superintendent of the Krause Plow Corp., Hutchinson, Kan.

BUSINESS ITEMS

Chandler-Evans Corp., Wallingford, Conn., wholly owned subsidiary of **Niles-Bement-Pond Co.**, West Hartford, Conn., has merged with the parent company. **B. H. Gilpin**, vice president and general manager of Chandler-Evans Corp. has become vice president of Niles-Bement-Pond and will continue as general manager of the Chandler-Evans Div. **M. E. Chandler**, formerly vice president in charge of engineering, has become manager of engineering and research for the division.

Meehanite Metal Corp., New Rochelle, N. Y., has created a sales engineering department to provide an advisory engineering service to users of castings. The new department is headed by **C. E. Herington**, company director of advertising and sales promotion.

Plomb Tool Co., Los Angeles, has acquired the **J. P. Danielson Co., Inc.**, Jamestown, N. Y.

The Farnham Manufacturing Co., Buffalo, N. Y., has merged with **Paragon Research, Inc.**

Edison General Electric Appliance Co., Chicago, Ill. has changed its name to **Hotpoint, Inc.**, a General Electric affiliate.

The Lindberg Steel Treating Co., Chicago, has opened a branch plant at 620 Buffalo Rd., Rochester, N. Y.

Superior Screw Machine Products Co., 673 Clinton St., Buffalo, N. Y., has been established with **John F. Zembaty** and **Edward J. Felong** as partners.

Willys-Overland Motors, Inc., has recently moved its Aircraft Research and Development Div. from Toledo, Ohio, to Los Angeles. Supersonic research for the Navy Bureau of Aeronautics is under the direction of **J. H. Talley**, general manager. Other staff members include **Dr. Norton B. Moore**, director of engineering; **Albert C. Reed**, assistant director of engineering; **Jean Wylie**, chief of research; and **Clifford J. Leisy**, chief administrative engineer.

Timken-Detroit Axle Co. has acquired **Bossert Corp., Inc.**, Utica, N.Y.

Banks Moreland Co., Houston, Texas, has become a division of the **Graver Tank & Mfg. Co., Inc.**, East Chicago, Ind. The new division will be under the management of **Banks Moreland**, who has been made a vice president of Graver Tank & Mfg. Co., Inc.

The Standard Tool & Manufacturing Co., Inc. has been established at 3418 Bernard St., St. Louis, Mo., with **Sam Goldstein** as president.

The Nu-Art Aluminum Products, Inc., Buffalo, N. Y., has moved to 65 Carroll St.

Kennametal, Inc., Latrobe, Pa., has appointed the **Walter R. Hammond Co.**, 255 Third Ave., So., Minneapolis, Minn., as its agent in Minn., N. D. and S. D. **The Martin Supply Co.**, 413 So. Kenosha St., Tulsa, Okla., has been named Kennametal agent for Okla.

Blue Ridge Pressure Castings, Inc., Lehighton, Pa., has been established to produce brass castings. **Thomas C. Wilson** is manager of the company and **Allen B. Behler**, superintendent.

OBITUARIES

Arvid Peterson, chief engineer in charge of the Pump and Compressor Div., DeLaval Steam Turbine Co., Trenton, N. J., passed away Dec. 19. He had been associated with the company for nearly 40 years.

William R. King, sales manager of W. K. Stamets Co., Pittsburgh, Pa., died Dec. 30. Before joining the firm 30 years ago, he was associated with the Firth Sterling Steel Co.

Carl E. Kramer, founder and senior vice president in charge of the Cleveland division of United Screw and Bolt Co. died Dec. 22.

Charles B. Thwing, 87, president of the Thwing-Albert Instrument Co., Philadelphia, Pa., died Dec. 12.

S. G. McAllister

Sydney G. McAllister, 67, former president of the International Harvester Co. from 1935-1940, died Dec. 25. He started with the company in 1897 as an office boy with the McCormick Works and became superintendent of the Auburn, N. Y. works in 1909. He was later placed in charge of all European manufacturing and in 1931 was named vice president in charge of engineering, patents, fiber and traffic. At the time of his death, he was chairman of the executive committee of the board of directors.

Mrs. Pearl E. Stokes, president of Detroit Die Set Corp., Detroit, since 1942, passed away Dec. 17. She had been associated with the company for 17 years.

Archie E. Smith, factory manager of the Curtiss-Wright Corp. Kenmore, N. Y. plant during the war, died Dec. 16. He joined Curtiss-Wright in 1934 after having been with the Fokker Aircraft Co. for 25 years.

Charles H. Norris, 81, retired master mechanic of the American Hardware Corp., died Dec.. 18

MEETINGS

American Society for Testing Materials. Spring meeting and committee week. Benjamin Franklin Hotel, Philadelphia, Pa. Feb. 24-28. R. J. Painter, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

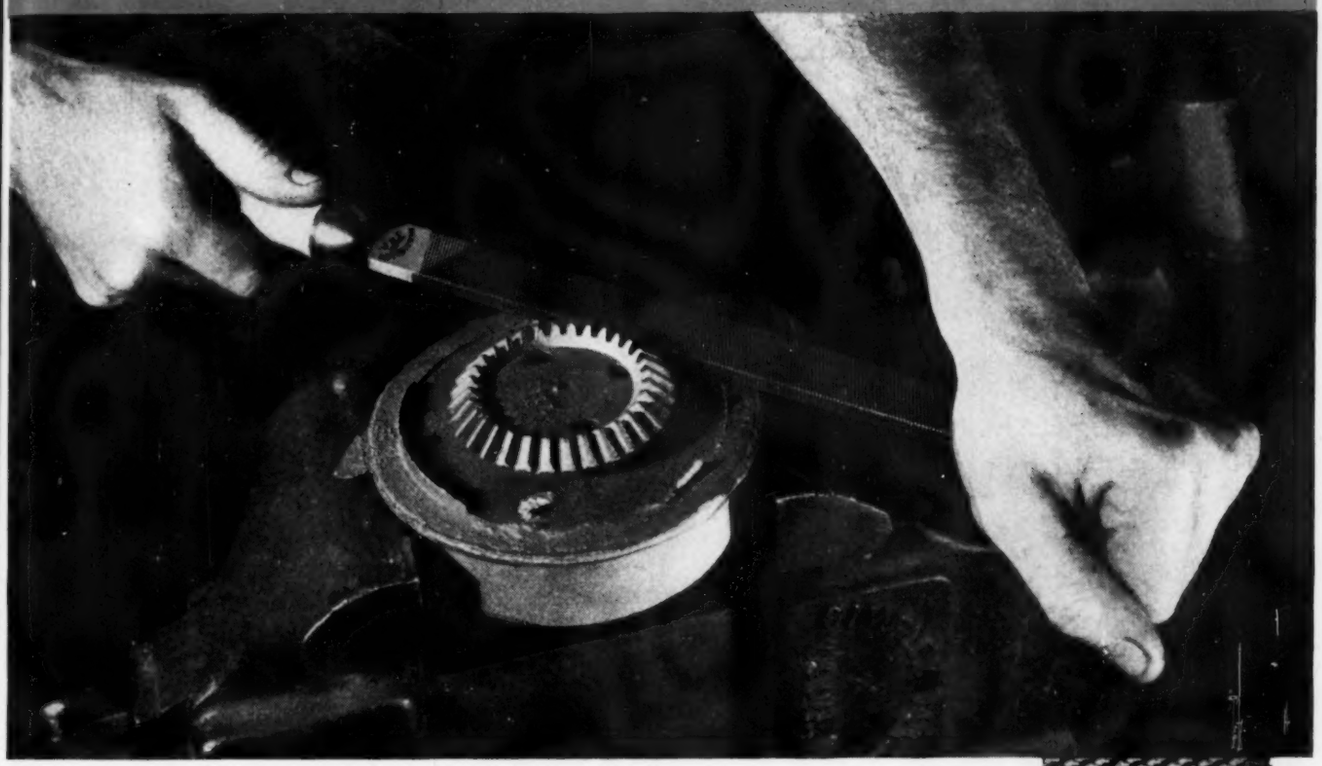
American Society of Mechanical Engineers. Spring meeting. The Mayo Hotel, Tulsa, Okla. March 2-5. Ernest Hartford, assistant secretary, 29 W. 39 St., New York, N. Y.

Magnesium Association and U. S. Army Air Forces. Magnesium Exhibit. Wright Field, Dayton, Ohio. Feb. 4-6. T. W. Atkins, executive vice president, Magnesium Association, 30 Rockefeller Plaza, New York, N. Y.

National Materials Handling Exposition. Public Auditorium. Cleveland, Ohio. Jan. 14-17. Ezra W. Clark, chairman, P. O. Box 178, Battle Creek, Mich.

Society of Plastics Engineers. National Plastics Show. Navy Pier, Chicago, Ill. Jan. 25-31. W. B. Hoey, executive secretary, 203 Theater Bldg., Birmingham, Mich.

ROUGH FILING calls for TOUGH FILES



SNAGGING a rough casting with an ordinary file is a sure invitation to headaches—*and "toothaches"!* Hard projections and sharp edges put a severe strain on regular file teeth—often cause them to shell or break out under pressure. Roughing-down calls for a file with an exceptionally strong tooth construction.

The right file for the job is the Nicholson or Black Diamond Special Purpose Foundry File, with extra-sturdy teeth designed to absorb shock and resist breaking. Specializing in rough use—like knocking fins and sprues off foundry castings or filing the narrow edges and sharp corners of dies—this "bruiser" of the file family continues to give efficient service long after regular files have been discarded.

Made in Flat and Half Round shapes, sizes 8" to 14". Stamped "Foundry."

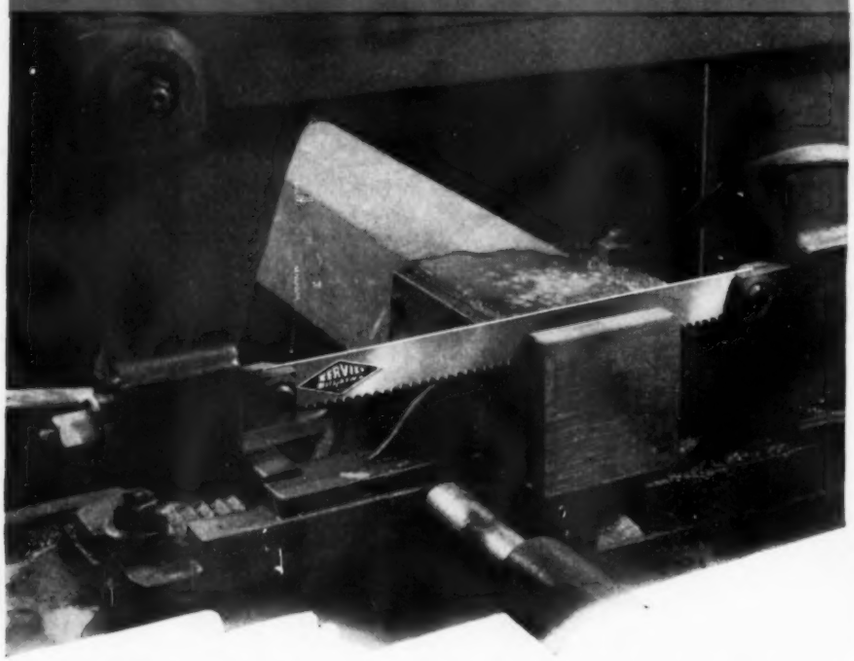
• **OTHER NICHOLSON AND BLACK DIAMOND SPECIAL PURPOSE FILES** include files for: Aluminum, Stainless Steel, Brass, Lead, Die Castings, Die Making, Lathe Filing, plus milled Curved Tooth files and a wide range of Swiss Pattern precision files. Order through your industrial distributor.

NICHOLSON U.S.A. **NICHOLSON FILE CO. • 29 ACORN STREET, PROVIDENCE 1, R. I.** BLACK DIAMOND TRADE MARK
(In Canada, Port Hope, Ont.)

NICHOLSON FILES *FOR EVERY PURPOSE*

PUT THE *Right* BLADES

ON YOUR POWER MACHINES



BARNES POWER HACK SAW BLADES

Choosing the *right* blade is important! Equally important is the adjustment of your power saw and the correct feed and speed for the particular sawing operation. Only then are you assured fast, dependable metal cutting, maximum cutting efficiency and economical blade life.

Make use of the handy free Barnes Hack Saw Production Calculator and Barnes factory-trained Service Engineers who can render you invaluable assistance and help you attain top sawing efficiency. Call your distributor.

There is an Industrial Supply Distributor near you carrying a complete line of Barnes hack saw blades and metal cutting band saws. He is interested in serving you—call him today!

ESTABLISHED 1919

W. O. BARNES CO., INC.

DETROIT 14, MICHIGAN

TO THE EDITOR

MARK SMALL TOOLS CLEARLY!

In the last analysis, toolmakers and machinists are a major influence in shop decisions on what makes of tools are to be purchased. As they are the users, no one is in a better position to judge quality and design from a performance standpoint. Thus, it behooves makers to consider the user when they develop markings—for markings specifying size and maker can do more to create satisfaction—or end it—in the shop than is generally realized.

There is no present standard for marking drills, reamers, taps, cutters, dies and counterbores. Each manufacturer uses his own size of stamp and location on the tool.

In today's market, time is a very important item of cost—one that costs money while men wait at the toolcrib window because the attendant can't find the size of tool or waste time at their machines trying to find it themselves.

Probably the worst offenders are etched data, usually etched in the spot where first use erases the etching.

More consideration should be given to marking these small tools, using the largest symbols possible and in a standard place where use will not obliterate them. In most cases this can be done without additional cost. Standard locations and lettering would pay dividends too in consumer relations. Many of us would be willing to pay more in first cost to save more in use.

Walter C. Ryder
General Foreman
Submarine Signal Co.

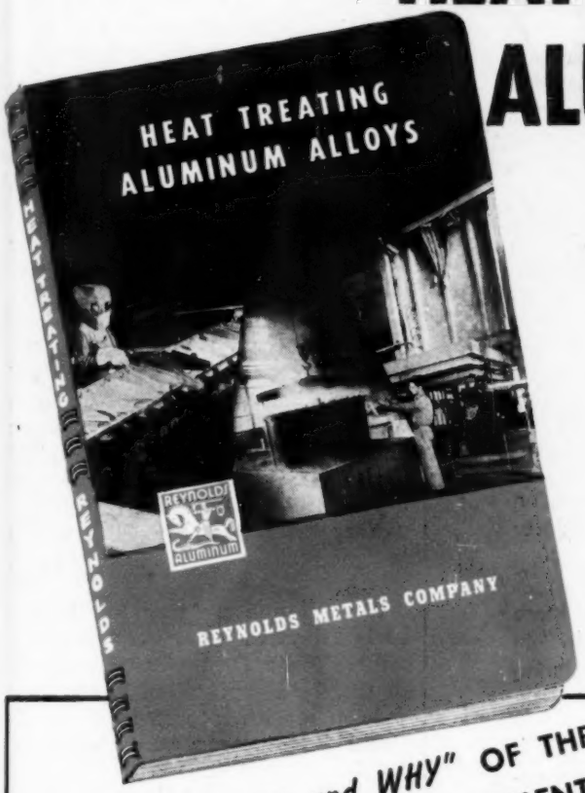
•

OVERCOMING RESISTANCE—AND HOGGING CREDIT

Two points brought out in a recent issue recall contacts with forward-looking shop executives in the years when I was actively gathering material for *American Machinist*. The editorial quoting Bill Kirk's talk on secondary resistance brings to mind Master Mechanic Harry M. Westbrook of the Battle Creek, Mich., shops of the Grand Trunk Railway.

It was Harry's plan to "sell" a new machine to his men before he bought it. He would take one or two of his good men to some shop where the new machine was at work and

New Handbook on "HEAT TREATING ALUMINUM ALLOYS"



THE "WHAT, HOW and WHY" OF THE METALLURGY AND HEAT TREATMENT OF ALL TYPES OF ALUMINUM ALLOYS

"Heat-Treating Aluminum Alloys," the latest Reynolds technical handbook is a gold mine of practical information for everyone working with aluminum alloys, both the non-technical man and the highly trained technician.

For the non-technical reader Section One explains in simple language the underlying principles of metallurgy and heat treatment of aluminum. For the metallurgist there are accurate charts of annealing and heat-treating cycles and soaking times, detailed technical discussions of common thermal treatments, charts and tables of typical mechanical properties of 96 different alloys and tempers, valuable information on possible difficulties and their cure.

"Heat-Treating Aluminum Alloys" contains one hundred and forty-four pages, 81 illustrations, 13 tables, 18 photomicrographs, 2 charts; an itemized index for quick reference; and a glossary of terms for simple, easily understandable reading.

This is just one of several recent technical aids put out by Reynolds Metals Company that help bring you up to date on the latest developments in the aluminum industry. Just fill out the coupon below and mail with your check. Your copy will be sent you at once. Reynolds Metals Company, 2523 South Third Street, Louisville 1, Kentucky.

WELDING ALUMINUM
A new handbook on Welding Aluminum giving detailed information on 11 aluminum welding processes from edge preparation to finishing. Illustrated with photographs, charts and tables on properties, gauges, sizes and strengths. Price: $1.00.

ALLOY SELECTOR
Just two settings to place at your finger tips the mechanical properties, chemical composition, physical constants, thermal treatments, and specification numbers of *18 aluminum alloys*. Simple to operate. Price $1.00.

METALS WEIGHT CALCULATOR
One of the handiest calculating devices ever developed . . . simple . . . accurate . . . fast. Calculates weights of aluminum, magnesium, steel, brass, copper, and nickel. Only $.50.

MACHINING ALUMINUM ALLOYS
124 pages packed with practical up-to-date facts about machining aluminum alloys. Eight double-page charts of easily usable data on tooling, speeds and feeds for eight important types of machining operations. Prices $1.00.

1468-A1-1B

PLEASE PRINT OR TYPE CAREFULLY

Reynolds Metals Company
2523 South Third Street, Louisville 1, Kentucky

Please send me "Heat-Treating Aluminum Alloys." I enclose $1.00 (check or money order)* to cover the cost of printing and mailing.

NAME_____

TITLE_____

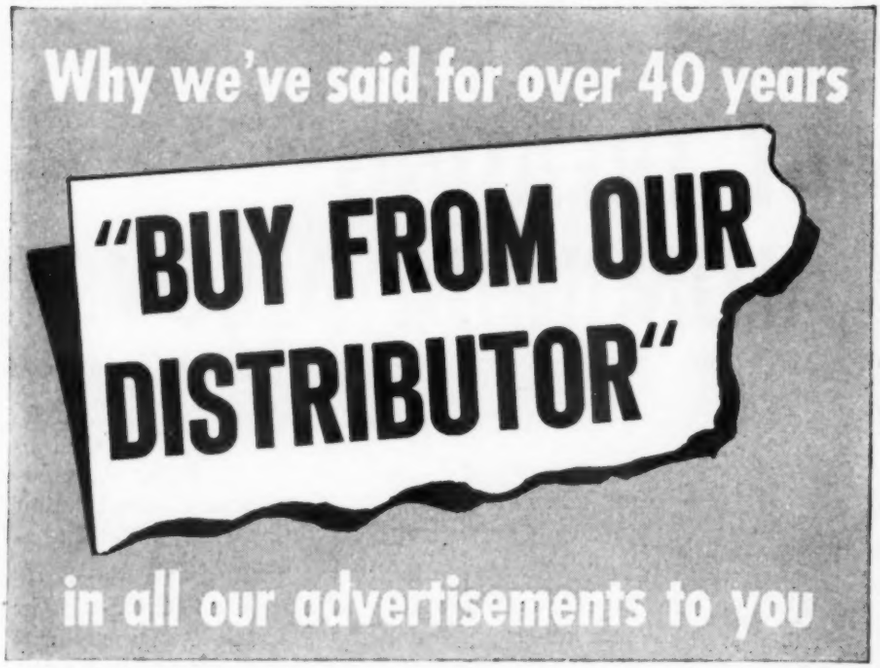
COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

( ) Please send me a copy of "Welding Aluminum." I enclose $1.00.
( ) Please send me a copy of "Machining Aluminum Alloys." I enclose $1.00.
( ) Please send me a Reynolds Aluminum Alloy Selector. I enclose $1.00.
( ) Please send me a Reynolds Weight Calculator. I enclose 50 cents.

***Please do not send purchase orders, cash or stamps!**



Since we started business in 1900, our policy of 100% cooperation with Distributors has been as much a part of us as our name and our products.

You as an industrial *user* benefit because the Distributor is far more than a mere middleman or broker. He is a "specialist's specialist" in supplying industrial tools and parts which lower your manufacturing costs.

Could you, alone, possibly keep abreast of ALL products and developments that save time . . . reduce production costs . . . increase manpower, tool and machine efficiency? Your Distributor does all this for you . . . and separates the chaff from the wheat in the doing.

Perhaps over the years you took your Distributors' services for granted —until war came—and scarcities. Then overnight you realized what a miracle he could perform in tapping sources countrywide to provide you with the "makings" for all-out production.

The Distributor performs many other services for you which if attempted by the manufacturer would be either entirely impractical commercially or would sky-rocket cost. These services include warehousing, selling, credit, delivery, quick, on-the-spot "trouble-shooting" when necessary, technical counsel from extensive and intensive knowledge of operating problems similar to yours.

Whether you call your Distributor "Bill", "Jim" or "Jones"—when you call on him—you receive the best there is in industrial supply and service! That's why we have always said and will continue to say—*"BUY FROM OUR DISTRIBUTOR"*.

American Swiss File & Tool Co., Elizabeth 1, N. J.

ASK FOR THEM BY NAME

American Swiss

SWISS PATTERN FILES

get them to study its operation. He told them he wanted their opinion of the machine before he bought it. They would ask questions of the operator, Harry would query some of its features and get the operator to sell it to his men. In this way men who would have opposed a new machine, or been lukewarm at best, became enthusiastic and sold it to the other men in the shop. It paid well in getting production from new machines right from the start.

The other subject is in tip No. 66 for Top Shop Men. This was also in a railroad shop. The master mechanic had got his job because he was somebody's brother-in-law. He was no mechanic and did not pretend to be. But he knew men and how to get their cooperation. We would walk through the shop and he'd stop half a dozen times by some workman. "Bill," he'd say, "I want you to show Mr. Colvin that gadget you made the other day for grinding air-brake valves." While Bill was getting his gadget the M.M. would tell me what a swell mechanic Bill was.

I recall one welding job in the early days of the oxy-acetylene torch. While Pete was showing it to me, he'd say: "Pete is the best darn man with a torch in six counties. I don't know what I'd do without him." Rank flattery of course—but sincere—and it helped everyone. There's more in managing men than being a good mechanic yourself.

Fred H. Colvin

•

JOB EVALUATION

I have read your study "Job-Evaluation Principles" with profound interest, the more so, as I was well prepared for its ideas, having chosen the same subject for my probationary treatise which I submitted to the Swiss Federal Institute of Technology in order to be recognized as a lecturer 4 years ago. As you probably know, our little country was completely surrounded by the Germans at that time, so I was far from possessing a complete documentation for my study as you evidently were. But I am happy to state that, nevertheless, our conceptions are to a large degree identical.

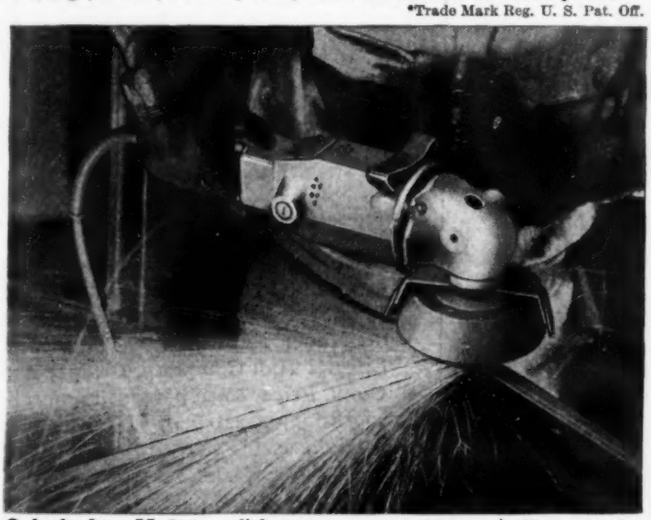
Among other things, you suggest that a "standardization of factors among all companies would be desirable for checking and comparing factor weightings." I made the same suggestion in Switzerland. Among the 5 or 6 greatest Swiss enterprises who make use of a different method each, an attempt is now being made

Black & Decker Sanders Speed Up Many Surfacing Jobs

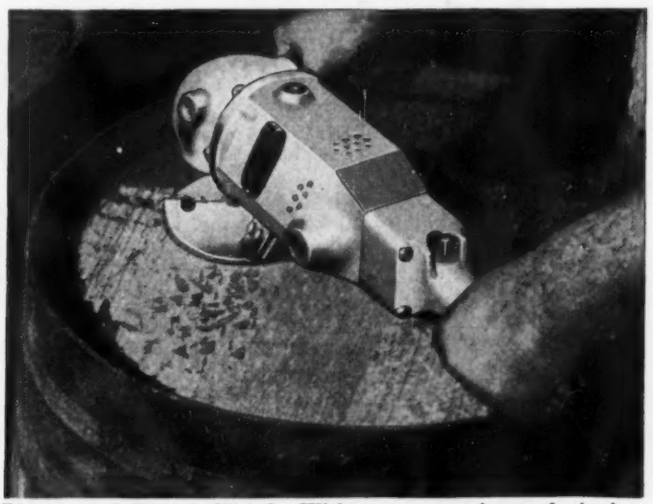
Speeds Wire Brushing—With "Whirlwind" Wire Cup Brushes, the Sander takes off old paint, rust, scale . . . cleans castings, tanks, boilers, vats, sheet metal and soldered joints.

*Trade Mark Reg. U. S. Pat. Off.

Sands Any Surface—With abrasive discs, a Black & Decker Portable Electric Sander speeds up sanding of any surface from fast metal removal to satin-smooth finishing.



Grinds Any Metal—With saucer or cup-type grinding wheels, the Black & Decker Sander removes metal; smooths welds and casting ridges; grinds off old rivets, studs and bolts; sharpens stationary machine blades.



Planes and Gouges Wood—With rotary gouging and planing heads, it shapes and semi-finishes lumber, working faster than jack plane and adz . . . removes stencil and brand marks from barrels and boxes.

See Your Black & Decker Distributor for helpful information on Sanders, Grinders, Drills, Saws and many other Portable Electric Tools for production, construction, maintenance and repair. For your free copy of our complete catalog, write today to: The Black & Decker Mfg. Co., 616 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS

Lifts, carries, tiers, loads of 1000 lbs. to 84"

CLARK TRUCLOADER

—light, compact, fast, designed for operating in and out of trucks, trailers, low-capacity elevators and general material handling operations. Gas and electric powered.

TO SEE CLARK TRUCLOADERS AT WORK IN BUSINESSES LIKE YOURS SEND FOR NEW PICTORIAL LITERATURE.

Visit National Material Handling Exposition Cleveland... January 14-17

CLARK TRUCTRACTOR

Division of CLARK EQUIPMENT COMPANY

BATTLE CREEK, MICHIGAN

OTHER PLANTS — BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN

Other CLARK Products

FORK LIFT TRUCKS
TOWING, DUMP AND SHOVEL TRACTORS
RAILWAY TRUCKS

DRILLS & GEARS

ELECTRIC STEEL CASTINGS
METAL SPOKE WHEELS
AXLES & HOUSINGS
TRANSMISSIONS

Prices on CLARK products will not be advanced in excess of increased costs.

to come to an undrestanding in this respect. There is no doubt that the medium and little enterprises will soon and easily adopt a method common to all the big ones.

As to the job conditions, I have come to the same conclusions as you. They are not the same in all the enterprises, so I can not approve of the usage of the methods of job evaluation in a uniform way, as it is at present done in France.

A fact that rather surprises me is that different methods are set up without using statistical mathematics to verify which method comes nearest to the differentiation which was developed naturally in each region by the working of the actual economic forces.

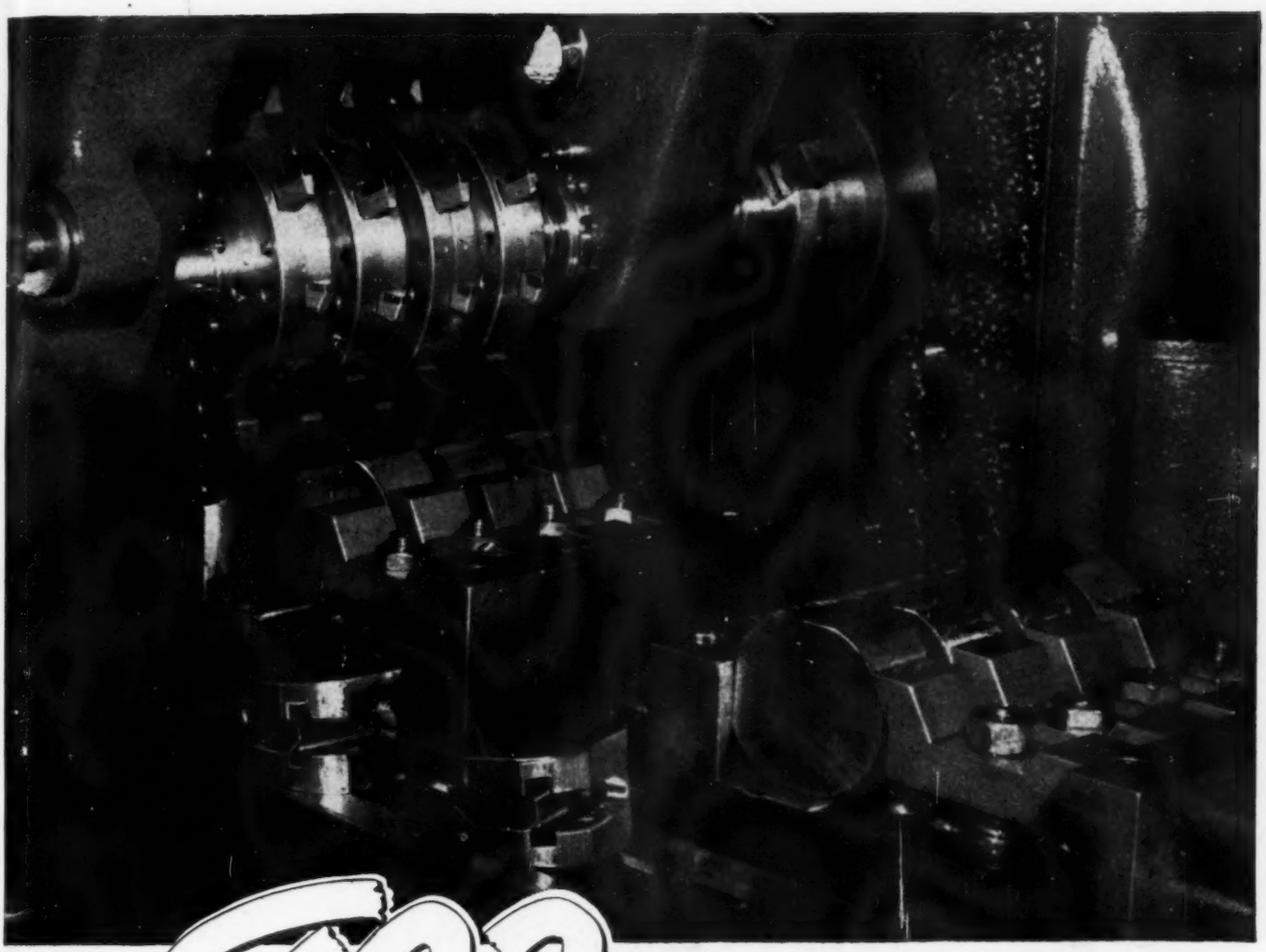
You do not speak without reserve of the scientific basis of the present methods, which are scientific only "in so far as human judgment may be considered scientific." This restriction shows that I am not the only one to deplore that no attempts have been made in this respect. I think, however, that the perspectives of such an application of statistical mathematics are much better in a big country like yours, for we simply have not the statistical material necessary for such investigations.

Paul Fornallaz
Zurich
Switzerland

NEW BOOKS

PRECISION HOLE LOCATIONS FOR INTERCHANGEABILITY IN TOOLMAKING AND PRODUCTION. *448 pages. By J. Robert Moore. Published by The Moore Special Tool Company, Bridgeport, Conn. Price: $3 to persons in metalworking industry of U.S.A.; $3.50 elsewhere.*

Over two years ago the Moore Special Tool Co., decided that a major postwar project would be the publication of a book on toolmaking practices that would be a genuine contribution to technical literature. The time of Mr. Moore was lavished on preparation of this book; more than 400 photographs and drawings of exceptional quality were produced to illustrate the text. The result is a textbook that is truly "unique," to use a word frowned upon by editors. Everything else about this book speaks of value: (1) the 184 pages of Woodworth tables for converting holes from 3 to 100 on circles to rectangular coordinates,



800 PIECES PER GRIND

machining stainless steel with FIRTHITE

This unusual operation is being performed by a leading valve manufacturing plant, machining 2¾" round 18-8 stainless steel.

Ten Firthite T-04 tools are staggered in each of four cutting heads on a milling machine to cut slots ¼" deep x 1¾" long, containing a 60° angle, 19/32" at the top of the angle.

The remarkably high output (800 pieces per grind) and the excellent results obtained attest again to the advisability of using Firthite sintered carbide tools for most satisfactory cutting performance. What is your problem?

Call Firth Sterling

STEEL & CARBIDE CORPORATION

BRANCH OFFICES: McKEESPORT, PA. · NEW YORK · HARTFORD · PHILADELPHIA · PITTSBURGH · CLEVELAND · DAYTON
DETROIT · CHICAGO · LOS ANGELES

Watch this Electric Hoist cut handling costs

SEE the speedy Meteor in action and you'll agree that materials handling costs are down for the full count. This heavy duty electric hoist is an outstanding performer . . . a time and money saver. Helical gears, airplane type cooling, low headroom, thermal protection, only 110 volts at push button station . . . and speed . . . are but a few of the Meteor's notable features. Bulletin 142 will tell you about all of them. Better still, the Meteor itself will bring you all of them.

Capacities from ½ ton and up. Lifting speeds from 18 to 60 feet per minute.

CHISHOLM-MOORE
HOIST CORPORATION
(Affiliated with Columbus-McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

(2) the fine paper, printing and binding.

The book is a comprehensive review of all hole-location practices and their evolution to the point where the toolmaker can now employ engineered methods and apply the principle of interchangeability to his own operations. As Mr. Moore says: "The ability to mass produce special tools, dies, fixtures, gages and molds under stringent accuracy requirements is the most significant industrial advance since man grasped the ability to mass-produce end products."

Discussed in detail are all of the laborious and time-consuming hole-location methods used prior to development of modern hole-location equipment, and still used in many shops. Comparisons are made between the old methods and new methods.

A chapter on "Jig Boring Practices," with over 100 photographs and drawings, presents instructional and operational short cuts dealing with a wide range of tools and dies, and gives time estimates on a variety of jobs.

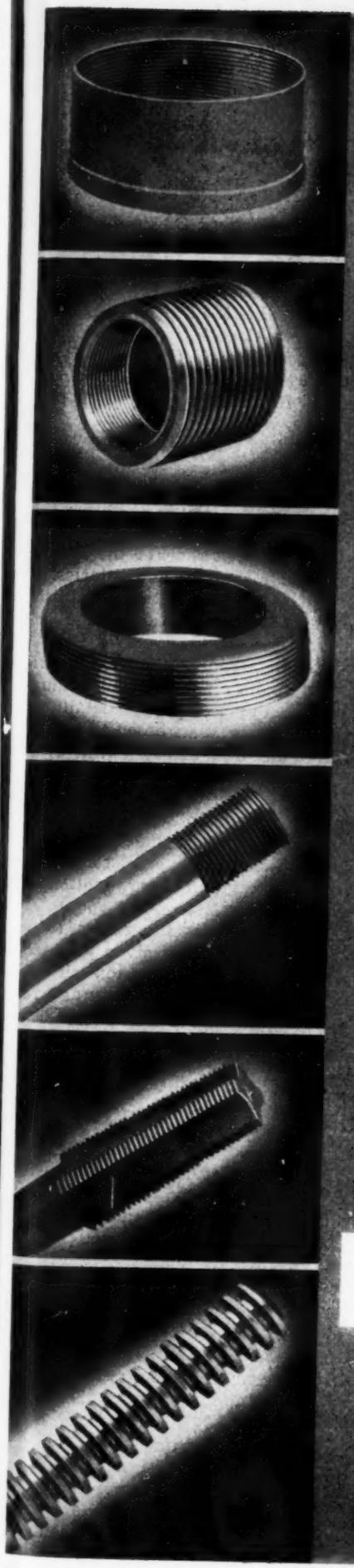
But the toolmaker can produce a fine job of hole location by jig boring, only to have his work distorted or decarburized in heat-treatment. Hence the need for a chapter "Hole Grinding in Jig Time," which details modern methods for finish-grinding holes in hardened parts.

All of the foregoing leads up to the question: "Why not interchangeability in toolmaking, so that the work can be broken down into simple elements made strictly to dimensions, and thus cut the time of producing a set of tools, and even duplicated sets, by using several men on the job?" All holes in die parts may be ground, including die holes. Mating holes in punch plates are jig-bored with full assurance of accurate alignment, without the necessity of transferring distortion errors and carrying them along through the whole job. By following this system, complicated progressive dies that would take six months to make by ordinary methods have been turned out in a few weeks.

•

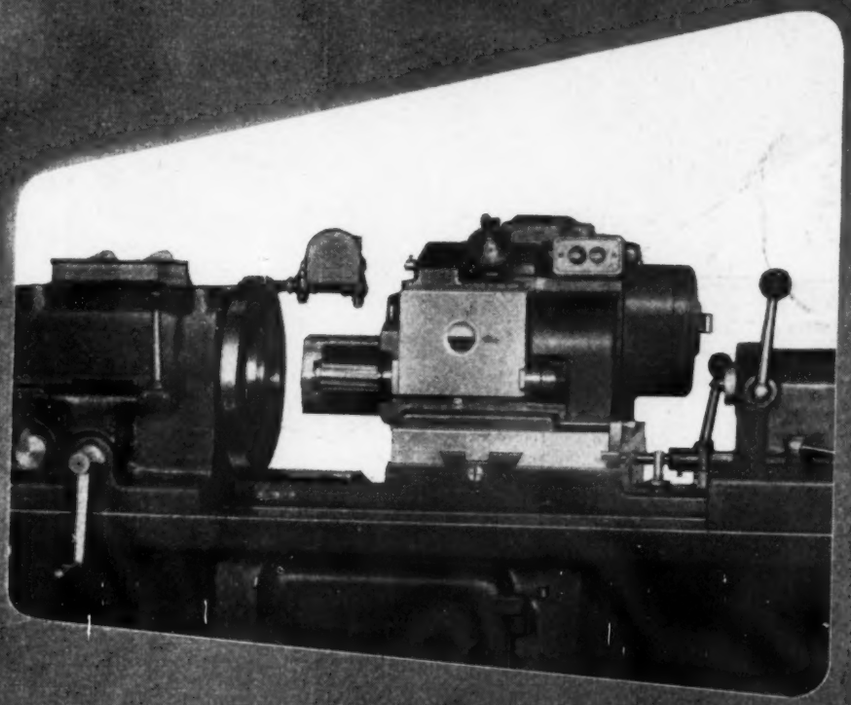
MECHANICAL WORLD MONOGRAPHS—*Published by Emmott & Co., Limited, 31 King St. West, Manchester 3, England.*

THE WORKS' TECHNICAL INFORMATION SERVICE—*By R. Howard. 24 pages. Price 1s. 6d.* This monograph (22) discusses the need and development of a technical information depart-



YOUR THREADING JOB MAY BE

ONE OF SIX



If it is versatility you are looking for, Hanson-Whitney Thread Milling Machines have it. Whether the job calls for external or internal threads; right or left hand threads; straight or tapered threads a Hanson-Whitney does it automatically . . . without lost motion or reliance on the human element. The thread cutting control is entirely mechanical. Accuracy can be held to close tolerances . . . production is stepped up and costs are lowered. Our engineers are always ready to help you find new ways to improve your thread milling production. For further information, write: The Hanson Whitney Machine Company, Hartford, Connecticut.

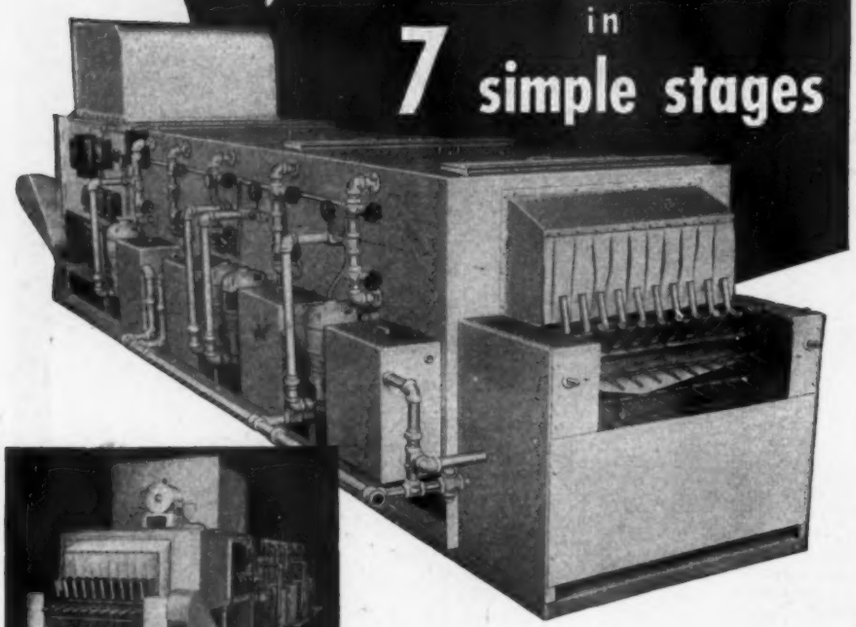
Hand it to

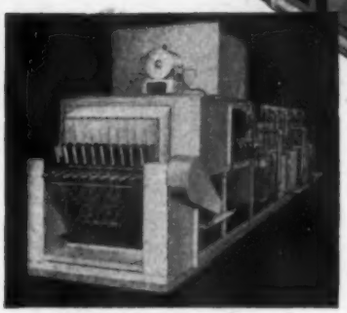
Hanson Whitney

MACHINE COMPANY

HARTFORD • CONNECTICUT

Speedier CLEANING in 7 simple stages





ABOVE: Loading end of Machine

LEFT: Discharge end of Machine

The cleaning of cylindrical brass cases following polishing and directly prior to plating, was a problem in a large metal parts manufacturing plant. The **OPTIMUS** Flat Conveyor Type Washing Machine shown above, now handles this operation in seven simple consecutive stages: Hot Alkali Wash, Drain, Hot Water Rinse, Warm Sodium Cyanide Wash, Cold Rinse to Sewer, Hot Rinse, Dry.

The entire operation takes the parts directly from polishing and feeds direct to the plating machine, the entire cleaning operation being timed to fit in with these other steps. The two hot rinses are hooked in sequence, thus effecting a further operating saving. Conveyor can also be built with flight bars for baskets and individual pieces, or with a mesh belt for any type of parts in bulk or individual pieces.

- *The* **RIGHT** *Machine*
- *The* **PROPER** *Detergent*
- *The* **CORRECT** *Cleaning Method*

OPTIMUS
Provides them all!

An **OPTIMUS** Plan for the mechanized handling of your metal parts through washing, degreasing, rinsing and drying, can assist you in saving labor, materials and speeding up production. Submit your problems to **OPTIMUS.**

OPTIMUS EQUIPMENT COMPANY
ENGINEERS AND MANUFACTURERS
151 CHURCH STREET, MATAWAN, N. J.

STANDARD AND SPECIAL TYPES OF EQUIPMENT FROM THE SMALLEST TO THE LARGEST SIZES FOR A WIDE VARIETY OF OPERATIONS.

OPTIMUS EQUIPMENT
FOR CLEANING · RINSING · DEGREASING · PICKLING AND DRYING OF METAL PARTS

ment. It directs attention to its importance and indicates lines along which it may function effectively. Sources of information are presented, as well as recommended methods for indexing and other functions of such a department.

•

JOB EVALUATION AND EMPLOYEE RATING—*By Richard C. Smith, Director of Industrial Relations, and Mathew J. Murphy, Assistant Director of Industrial Relations, Bendix Radio Division, Bendix Aircraft Corporation. 255 pages. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y. Price $2.75.*

Published as a unit of the McGraw-Hill industrial organization and management series, Job Evaluation and Employee Rating analyzes the various methods of determining equitable distribution of the money available for wages and salaries. It discusses policy affecting establishment of a program and wage administration.

Ranking, grading, factor-comparison and point methods of job evaluation are presented in detail. A weighted-point plan, based on twelve factors and designed to permit evaluation of both hourly and salary jobs, is introduced with degree values and definitions. Invaluable information is included on job descriptions, employee classification, area surveys and determination of wage scales.

Merit rating is treated as fully, with emphasis being given to objectives and benefits of systematic rating. The chapter on validity and reliability of ratings and psychological problems encountered is of particular value, although the use of correlation procedures in rating could have been expanded.

The authors are questioned for giving credit to the National Electrical Manufacturers Association for developing the plan later adopted by the National Metal Trades Association. This plan was developed by L. B. Michael and L. V. Fisher, Western Electric Co., Inc., and adopted by both NEMA and NMTA.

•

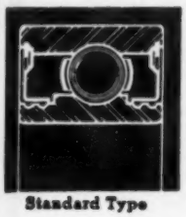
AUTOMATIC INTERPOLATING CHARTS—*Devised and published by F. R. Gerber, 1305 S.W. 12th Ave., Portland 1, Ore. Price $2.*

Two interpolation charts and nine reference tables make up a 4-sheet kit designed as a tool for scientists,

3

The "Cartridge" Bearing

TOMORROW'S BEARING— HERE TODAY



Standard Type

This revolutionary forward step in bearing design has proved itself on the toughest assignments for the past eleven years. It is not only a highly efficient precision bearing, but its self-sealing features also help you improve the performance and lower the cost of producing your own equipment through streamlined design. Here are the facts:

Why it is a Better Bearing

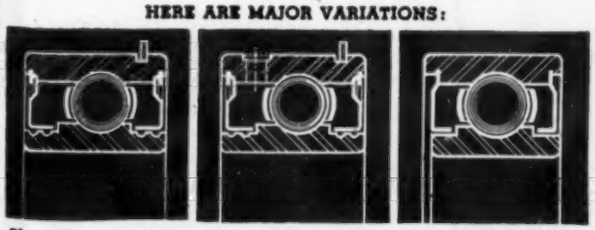
- 100% more grease capacity than any other standard self-sealed bearing.
- Factory packed with Norma "Stability-Tested" grease. Relubricate only after years of service.
- Grease retained close to balls and raceways by built-in, wearless seals.
- Flanged seals with grease grooves provide a dam against leakage; prevent entrance of dirt.

How it aids Your Design Problems

- Eliminates up to 10 machining operations and up to 22 parts required with some conventional mounting.
- Prevents slippage, peening, cocking — obviates use of steel inserts in soft metal housings.
- Increases shaft strength; reduces overhang; provides compactness — locknuts and wide sealing parts are eliminated.

PATENTED BY NORMA-HOFFMANN

HERE ARE MAJOR VARIATIONS:



Shoulder (snap) wire. No housing shoulders needed. Seals removable.

Grease filling opening. Shoulder ring optional. Seals removable.

Permanently sealed. For shafts under 20 m/m. Seals not removable.

NOTE: Write for "Cartridge" Bearing Catalogue. Address Dept. B

"NORMA-HOFFMANN"

PRECISION BALL, ROLLER AND THRUST BEARINGS

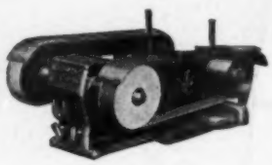
NORMA-HOFFMANN BEARINGS CORPORATION
STAMFORD, CONNECTICUT
FIELD OFFICES: New York, Chicago, Cleveland, Detroit, Pittsburgh, Cincinnati, Los Angeles, San Francisco, Portland, Ore., Seattle, Phoenix

Hammond of KALAMAZOO

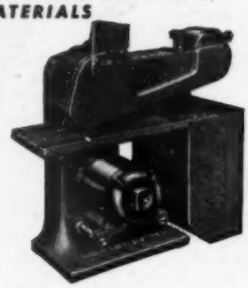
Abrasive Belt
GRINDER-POLISHERS

FOR FASTER GRINDING AND FINISHING OPERATIONS ON WOOD, METAL, PLASTICS AND OTHER MATERIALS

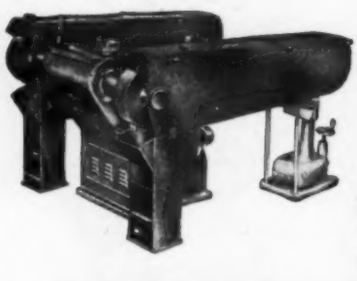
MODEL F-2 FLEXIBLE BELT — Especially suited for irregular shaped parts, eliminates costly hand filing.



MODEL NO. 5 DRI ONLY—UP TO 3" BELTS A popular hi-production grinding, polishing, buffing, deburring and brushing machine.

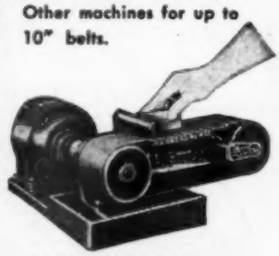


MODEL VH-6 WET-n-DRI, 6" BELTS — Vertical or Horizontal position. Other machines for up to 10" belts.



VARIABLE SPEED LATHE AND BACKSTANDS

Any speed from 1500 to 3000 RPM. Backstands can be purchased separately.



MODEL "400" WET-n-DRI, 4" BELTS Vertical or horizontal position. A popular belt grinder for finishing operations.

CARBIDE TOOL GRINDERS

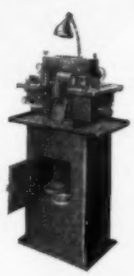
PRECISION BUILT MACHINES WITH NEW OUTSTANDING FEATURES

10" WET and DRY CARBIDE TOOL GRINDER

No Spray — No Splash Guards, Safety Cup discs and heavy construction for fast, efficient grinding.

CARBIDE TOOL AND FINISHING GRINDER MODEL 7

For rough and finishing small tools and diamond wheel finishing of all size tools.



HAMMOND PRODUCTS — CARBIDE, GENERAL PURPOSE & ABRASIVE BELT GRINDERS • AUTOMATIC & CYLINDRICAL FINISHERS • POLISHING LATHES

Hammond Machinery Builders INC

1618 DOUGLAS AVENUE • KALAMAZOO 54, MICHIGAN

engineers and computers. Both straight and curved interpolation can be handled by the charts.

Chart 1, for straight interpolation, eliminates lengthy arithmetical solutions by providing a special paper rule to be used with either of two tabular-difference layouts. Uses include interpolating in trigonometric, logarithmic, interest, astronomical, squares, cubes, roots, areas and other tables.

Chart 2, for curved interpolation, is based on the method of point second differences, explained fully. It determines easily and quickly desired numbers lying between numbers that progress by increasingly larger or smaller steps.

In addition to the charts, shortcut methods for straight interpolation are given for cases where tabular differences are unwieldy and a calculating machine is to be used. Seven of the nine reference tables aid in computations involving angle and time measurements, one covers physical constants and another is a condensed 7-place table of trigonometric functions.

•

PERSONNEL SERIES BULLETINS—*Published by the American Management Association, 330 West 42nd St., New York, 18, N. Y., from papers presented at the personnel conferences of the AMA held in February, 1946.*

Bulletin 97 (48 pages—$0.75) includes the following papers: Labor Relations Today, Fact Finding and Ability to Pay, Salient Characteristics of Postwar Union Agreements, and Implications of Company Security Against Stoppages.

Bulletin 98 (32 pages—$0.75) includes: The Common Goal of Management and Labor, Labor and Management Look Ahead, and Labor, Management and Congress.

Bulletin 99 (42 pages—$0.75) includes: Labor Relations in a Non-Unionized Company, Areas for Labor and Management, and Employee and Public Relations.

Bulletin 100 (44 pages—$0.75) includes: Employee Selection for the Average Company; Merit Rating: Its Validity and Technique; Executive Development Program for Affiliates of Standard Oil Co. (N.J.); Interpretation of Personnel Reports and Statistics.

Executives in charge of labor relations and personnel will probably wish to add these bulletins to their reference files, after reading them carefully to get the benefit of the thinking of the experts participating

Announcing

ORANGE *Cage Type* NEEDLE BEARINGS

IMPORTANT FEATURES

- Permanent alignment of rollers
- Less internal friction
- Smoother running
- Longer life hours expectancy
- Internal clearances can be controlled to meet exacting specifications
- Pentrate finish
  - —reduces friction
  - —aids lubrication
  - —increases durability
  - —provides rust and corrosion resistance
- Fully interchangeable in all component parts, with all standard sizes of heavy duty needle bearings
- Wide range of popular shaft sizes

ORANGE ROLLER BEARING CO., INC.
554 Main Street, Orange, N. J.

Write for Engineering Data

showing construction features, advantages, dimensions, capacities, etc.

ORANGE ROLLER BEARING CO., INC. AM
ORANGE, NEW JERSEY

Gentlemen:

Please send me Engineering Data on new Cage Type Needle Bearings.

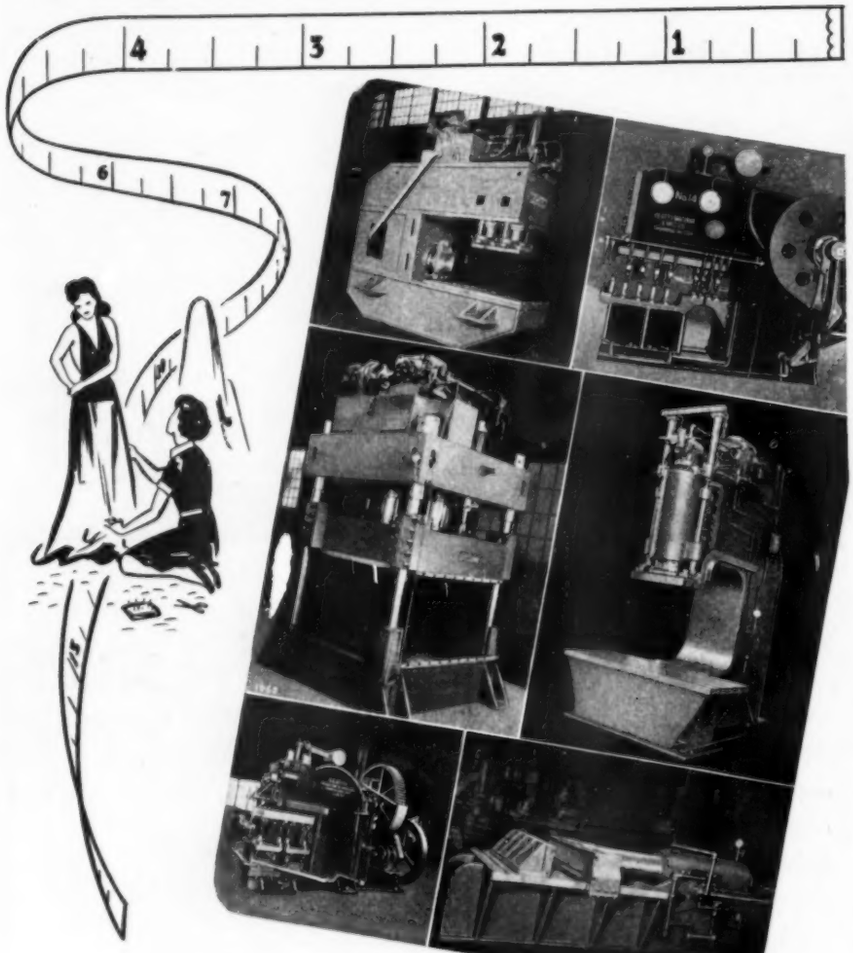
Name.....Title.....

Company.....

Address.....

City.....State.....

BEATTY machines are "Made to Measure"



BEATTY Heavy Metal Working Equipment is built not just to do A job, but to do THE job. Special production problems call for special equipment, and when special equipment must be designed wise industrialists call for a BEATTY engineer. Next time you have a heavy metal fabricating problem, let a BEATTY engineer help you find the answer.

BUILDERS OF:
Mechanical and Hydraulic Punches, Presses, Shears, Spacing Tables, Bulldozers, Pipe Benders and Extruding Machines.

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
HAMMOND, INDIANA

in these AMA discussions. Of most timely interest is the paper on "Implications of Company Security Against Stoppages," by Samuel Schuchter, vice-president, Goodall Co., Cincinnati, O., included in Bulletin 97, which points out some safeguards against unauthorized strikes included in recent labor-management agreements. A useful table for personnel men is included in the paper, "Interpretation of Personnel Reports and Statistics," by Dale Yoder, director, Industrial Relations Center, University of Michigan, in Bulletin 100, which presents a detailed check list of personnel records and statistics.

"Quotes"

Materials Handling Answer to Machine Efficiency

SAID JOHN C. WHITESELL, chief project engineer, The Budd Company, speaking before the Philadelphia chapter of the American Society of Tool Engineers:

"When we speak of cheaper manufacturing costs and better production methods, we are not only speaking of better tools and better equipment but better ways of doing the work. The average young engineer thinks that tools and equipment are the answer. But modern manufacturing is just as aware that Materials Handling is a part of better manufacturing as are the tools and equipment themselves. In most plants there is always sufficient thought allotted for the tools and equipment, and the Materials Handling problem is rated second."

"It was said at your annual meeting that in some industries the speed of some automatic machines had been increased to a point where the materials could not be brought to, and the finished product taken away, so the machine could develop its maximum efficiency. Naturally, better conveyors are the answer, whether floor or elevated type."

•

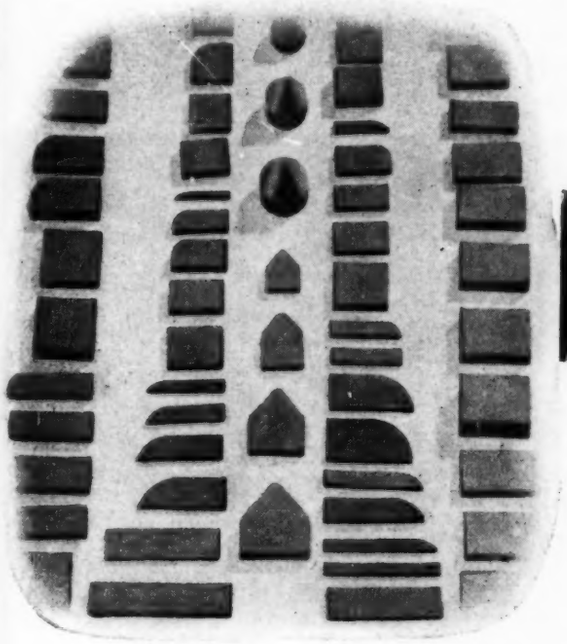
Economic Fallacy

POSTWAR possibilities can be realized to their fullest extent only on the basis of maximum productivity, according to William P. Kirk, vice-president of Pratt & Whitney Divi-

CARBOLOY (TRADEMARK) CEMENTED CARBIDE BLANKS *for every need!*

SPECIALS *in any shape or size*

Carboloy Cemented Carbide specially-shaped blanks are ideal for tips or inserts on tools, gages, cams, guides, work rests, or any part of your product subject to abrasive wear. Made to your exact specifications, they are supplied ready for use—following any brazing or grinding necessary. (For quotation on blanks for your needs, send detailed drawings.)



STANDARDS *as low as 9¢ each*

Standard Carboloy Cemented Carbide Blanks cover *up to 80%* of your carbide tool needs! In fact, just a small inventory of these low-cost blanks equips you for speedy tool-up on a wide range of average jobs. Available in grades for cutting steel, cast-iron, non-ferrous metals, and non-metallics . . . and in a wide range of sizes. Prices surprisingly low—over 50% of them priced between 9c and 73c! Stocked coast-to-coast for prompt delivery. Send for Catalog GT-175R today.

CARBOLOY COMPANY, INC.

11149 E. 8 MILE BLVD., • DETROIT 32, MICHIGAN

CHICAGO • CLEVELAND • HOUSTON • LOS ANGELES • MILWAUKEE • NEWARK • PHILADELPHIA • PITTSBURGH • THOMASTON

Also Sold By Leading Mill Supply Distributors

CARBOLOY (TRADEMARK) CEMENTED CARBIDES

STOCKED BY AUTHORIZED CARBOLOY CEMENTED CARBIDES DISTRIBUTORS IN 73 CITIES—Coast To Coast

DARNELL CASTERS

If you want maximum floor protection, economy and efficiency Demand Darnell Dependability...Made to give an extra long life of satisfactory service . . . . .

DARNELL CORP LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

sion, Niles-Bement-Pond Company. Mr. Kirk stated:

"There are a lot of people in this country who seem to have the idea that wage rates and employment levels can best be maintained by limiting productivity per man per hour. This is an economic fallacy. The fact is that in the long run real wage rates and employment levels can be increased only in proportion to the extent to which productivity per man per hour can be increased.

"The reason behind this fact is far deeper than a principle of economics. The basic reason is that there is no limit to human desires. The more things that people want, that can be offered to them at prices they can afford to pay, the larger will be the volume of business, and the greater will be the assurance of high wage and employment levels. The machine tool industry holds the key to this whole social and economic picture, because machine tools represent the key to cutting costs, increasing productivity, and lowering prices to the ultimate consumer.

"The sooner we can get government-owned machine tools out onto factory floors and producing on behalf of greater volume and lower costs, the better it will be for our national economy and for the machine tool industry itself."

An Old-Timer Shows 'Em

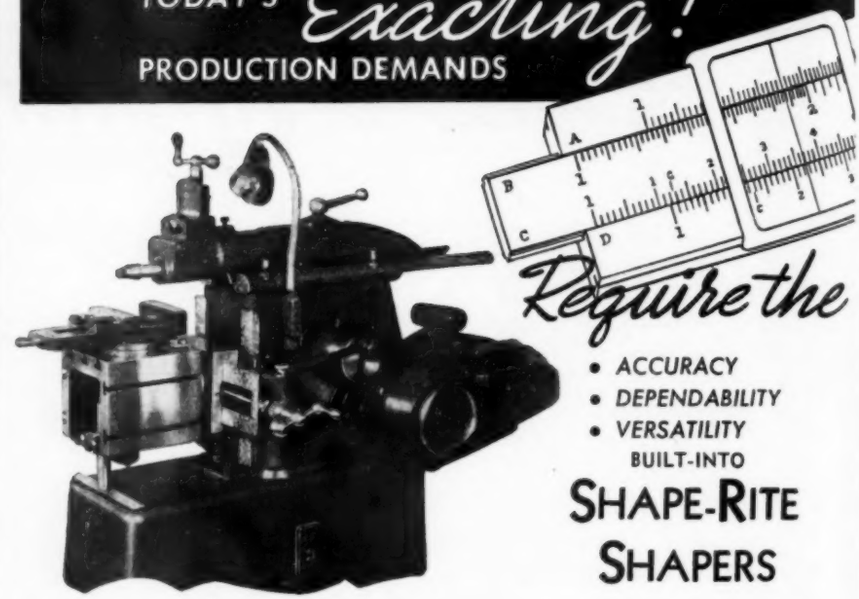
BY LEE L. DODDS

ANXIOUS TO DO his bit in the war effort, an old-timer came out of retirement and was hired by an aircraft company on the West Coast as a junior inspector, despite the fact he had been a chief inspector in two Eastern plants previously.

After several days of examining millions of machine screws, the old-timer's "know-how" got him transferred to the machine shop as an inspector of precision parts. Then he was instructed to take a three-month course in the Inspector's School, one hour a day on company time. He didn't object because airplane standards were much different from ASME standards, but it was amusing to sit and watch motion pictures of metalworking machines with which he was so familiar.

Finally, precision measuring devices were demonstrated. The sine-bar demonstration was right up the

TODAY'S *Exacting!* PRODUCTION DEMANDS



Require the

- *ACCURACY*
- *DEPENDABILITY*
- *VERSATILITY*

BUILT-INTO

SHAPE-RITE SHAPERS

You can depend upon the built-in accuracy and durability of Shape-Rite Shapers to withstand day-in and day-out capacity production. The speedy set up features and ease of operation will increase the output of precision work. Shape-Rite Shapers are Versatile, and will handle any type of work within the capacity of eight-inch stroke Shapers. Unexcelled for Tool and Die Makers and small instrument manufacturers. Complete specifications on request. *Write to Dept. A-2.*

Sales Service Machine Tool Co.
2363 UNIVERSITY AVE. ST. PAUL 4, MINNESOTA

Photographs courtesy The Erie Railroad

THE *Brushes* THAT HELP A RAILROAD KEEP *Geared for Action*

OSBORN BRUSHES ride the rails, help keep the rolling stock rolling for modern-minded Erie. In the Meadville shops alone, newly equipped with all the latest-type production and maintenance devices, brushes play an important role in department after department.

They deburr threads, clean and polish gauge cocks, globe and feed valves on air brakes. They help keep signalling and other safety equipment up to par. They're kept busy, day after day, conditioning and reconditioning welding torches—the most important single repair tool along a railroad's entire right-of-way.

When you see a railroad train, you don't think of the power brushes that help keep it rolling along on schedule. Neither do you think of brushes when you see an automobile, a typewriter or a telephone. Yet without power brushes and modern brushing techniques, all these articles (and almost any others you can think of!) would be more costly to make and maintain.

In almost every industry, Osborn brushes can help speed up manufacture, cut costs—and produce a better, more uniform, more saleable product.

Why not get the facts today as applied to your business? Without obligation, of course!

THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue *Cleveland, Ohio*

Osborn Brushes

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY

Your
ASSEMBLY SAVINGS
also
CUT SERVICING TIME

THE HOURS YOU SAVE in factory assembly by simply *peeling* precision laminations for accurate fitting of machine parts will be repeated by your users on every service adjustment. Want performance data and photo chart of applications?

Laminum shims are cut to your specifications, but shim materials for repair are sold through your industrial distributors.

Laminated Shim Company, Incorporated
50 Union Street · Glenbrook, Conn.

LAMINUM
THE SOLID SHIM THAT peels FOR ADJUSTMENT

2215

old-timer's alley because he was rated an expert in this field. An assistant chief inspector used a Starrett taper sleeve for demonstration. He clamped a sine-bar on a precision-ground square block, carefully levelled it with a dial indicator, and placed the sleeve on it. With the taper indicated, he subtracted the smaller reading from that of the large end and divided that by two and then consulted his handbook of sines to get the angle of the taper.

A less-experienced student asked why a bevel protractor couldn't be used. The assistant chief inspector said it couldn't and challenged anyone to prove differently. The old-timer took up the challenge.

When he reached for the squared block, the instructor objected, pointing out that he was supposed to use only the bevel protractor. After pointing out that the instructor couldn't measure the angle with his sine-bar alone, the old-timer placed the sleeve on the block, adjusted the protractor to the block and sleeve, and read the answer. Dividing it by two, his answer was the same as the instructor's. It took the old-timer two minutes to obtain the answer; the instructor had taken 15 minutes.

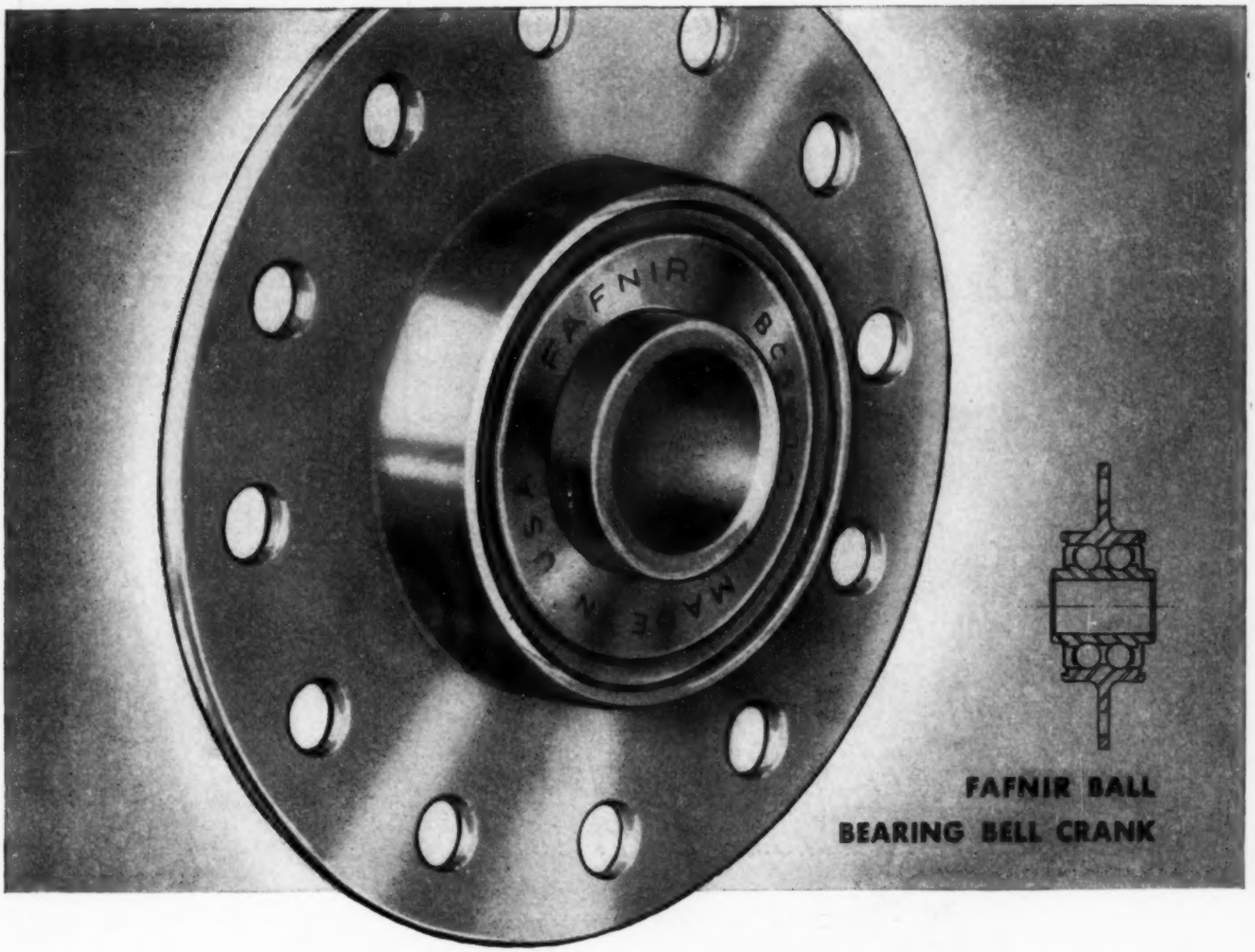
Micrometers were the subject of another session. The instructor was a senior inspector from the machine shop, and the old-timer knew he had wined and dined the "brass hats" to get his job in less than a year. During the forum period, the old-timer spoke up.

"I have trained many apprentices in use of micrometers," he said. "I taught them like this: A micrometer barrel represents the decimal divisions of one inch. There are 1,000 of these divisions. Now compare one inch with a $10 bill. There are 1,000 pennies in the bill. Most everyone knows how to make change and divide a $10 bill into any of its component parts. So, all you have to do is to think of thousandths of an inch as pennies. A reasonably intelligent apprentice has learned to read a micrometer well in about 15 min."

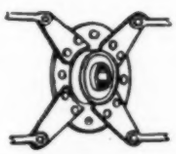
The instructor resented the intrusion and announced the students would continue to learn micrometer reading *his* way.

Under-rock Plants Work Out

According to Ralph Wallace in *The Washington* (D. C.) *Post* (Oct. 6, 1946), the Swedish have found unexpected advantages in the underground plants they built to avoid destruction by bombing. Construc-



A *ball bearing linkage for transmitting rotating, oscillating and reciprocating motion*



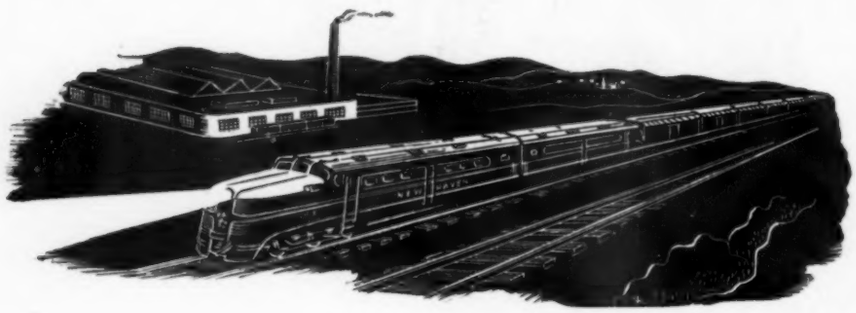
- **double-row ball bearings**
- **stainless steel shields or the new Fafnir PLYA-SEALS**
- **flange is tough, shock resisting analysis steel**
- **exposed surfaces cadmium plated**
- **two sizes of bore — .2500 and .3125 inches.**

FAFNIR designed this linkage unit for engine and flight controls in airplanes. Its simplicity, sturdiness, economy and ease of installation and maintenance have suggested a variety of applications to manufacturers of diverse machines and equipment requiring friction-free, positive linkage. Conveniently located flange holes permit attachment to Pitman arms and other mechanical connections to transmit rotary motion into reciprocating or oscillating motion, or vice versa. Flange is integral with the outer ring of this double row ball bearing, providing the rigidity needed to counteract side loads from angularly connected push-pull rods. Fafnir engineering services are available to you in developing the possibilities of this ball bearing linkage unit in your machines or equipment. Either send blue prints or write for data sheets on the Fafnir Ball Bearing Bell Crank. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

Want Fast, All Weather *Transportation?*

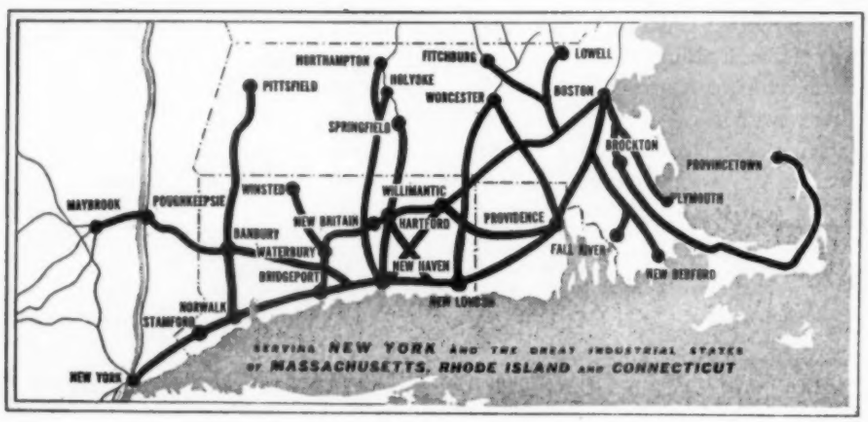


20,000,000 people are served by overnight freight service from New Haven Railroad Territory.

Coordinated railroad and highway freight service in Connecticut, Rhode Island and Massachusetts is second to none in America. *One-third* of the Nation may be reached by overnight railway express . . . and *more than half* of the Nation's population is only 24 hours by passenger train from Southern New England.

Dependable, all-weather train service is but one of many reasons why it pays to locate your industry along The New Haven Railroad. For a complete, concise resume of all the advantages available to you, write for a copy of "SOUTHERN NEW ENGLAND FOR TOMORROW'S INDUSTRY." Address: P. E. Benjamin, Mgr., Industrial Development, New Haven R. R., Room 201, 80 Federal Street, Boston 10, Mass.

THE NEW HAVEN R. R.



tion cost increases of 15% are balanced by reduced heating and maintenance costs, so net gain is 10% over a 30-yr. period. As in windowless plants in the U. S., there are no problems of exterior painting, no window washing or maintenance, and (because plants are blasted into granite) no roof repair costs.

Plants incorporate airtight steel doors and shutters on ventilating shafts so air can be cut off for as long as 24 hr. in case of gas or atomic attack—while production goes on. Yet one such metalworking plant, for example, can be cleared of its 3000 workers in 2 min., then any fire smothered in 5 to 8 min. by closing the doors.

Germany, of course, had similar plants. So does China—including seven power plants up to 8000 kw., with stacks zigzagged up through the rock to avoid bomb damage.

In such plants, air conditioning is simple and cheap—and workers like absence of drafts and sunlight glare.

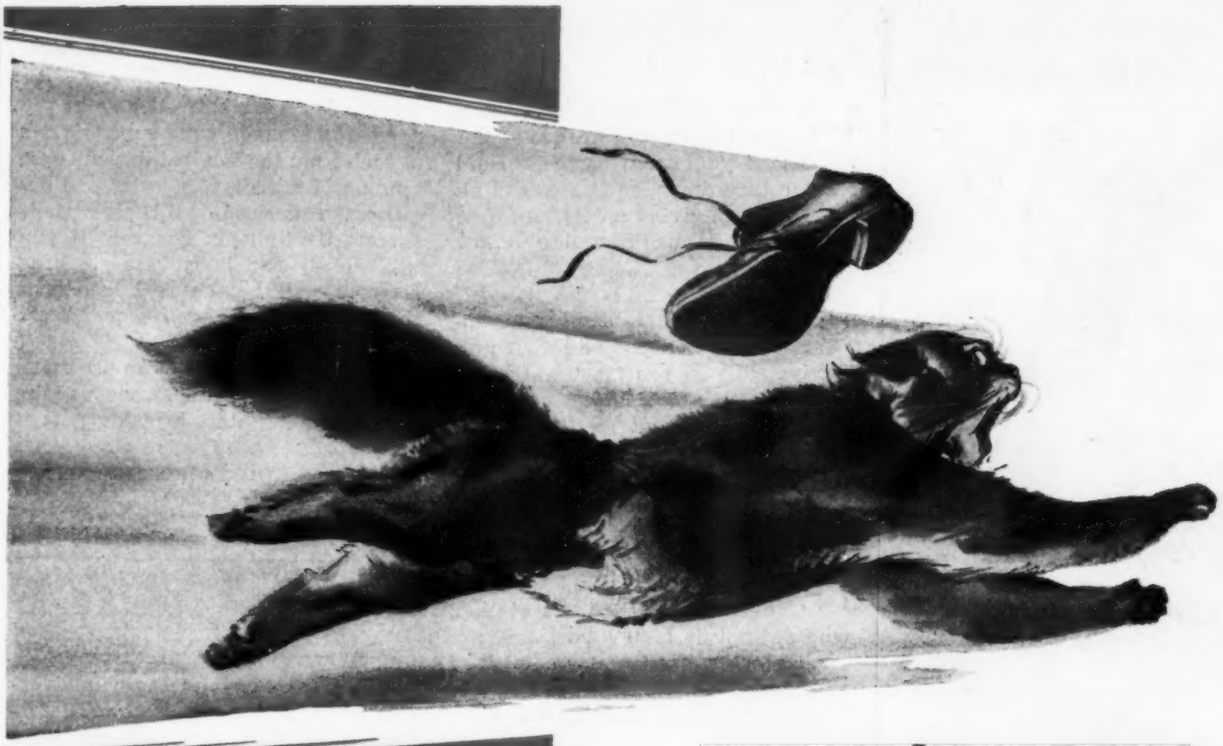
TIPS for Top Shop Men

143 A most important step is to create a favorable impression in the minds of "new help" by explaining details of working conditions, introducing associates and people to be contacted, pointing out rest facilities, and all the other steps involved in making a stranger feel at home. First impressions are lasting; be sure the new man's of you and the plant aren't "N.G."

144 Try to develop the ambitions of your subordinates and to stimulate them to increase production, individually and collectively. Their improvements reflects credit both on them and on you. By making them bigger you become bigger.

145 Go to annual picnics, swimming parties or other affairs "generated" by your men. Not only will you enjoy yourself among people with common interests, but you'll help to erase the little sore spots that inevitably crop up during working hours. You'll prove you're not a stuffed shirt and help other men to prove they're not.

46 Don't put off until tomorrow the improvements you should be making today. Procrastination doesn't promote efficiency whether



MAKE 'EM RUN

Like a Scared Cat!

Give YOUR air driven tools and cylinders the fast, smooth action of a scared cat. Install a NORGREN LUBRICATOR in the air line today.

See for yourself how sluggish, chattering air driven tools snap out of their slump and become peak producers.

The Norgren Lubricator injects exactly the right amount of oil into the air stream to lubricate every moving part. Insures fast, smooth trouble-free action when the tool is running—maximum protection against rust and corrosion when the tool is idle.

Simple to install direct in the air line. Automatic—works only when the tool operates. Sight feed—ends all guessing.

Write today for complete information. C. A. Norgren Co., 220 Santa Fe Drive, Denver 9, Colo.

Norgren

The Lyon

INTERNAL GROOVING TOOL

Its versatility saves costly preparation time—provides precision grooving of single or multiple grooves at a production rate—plus economy of set-up time—and low initial cost. The LYON has been designed for making internal grooves to tolerances of .001" using any drill press, turret lathe, radial drill or automatic equipment.

By changing only bushings and cutters within the tool model range, you have at your command a wide variety of bore sizes and shapes. A simple adjustment regulates location and depth of groove. Work cannot be scratched or marred because the head of the tool does not turn when the cutter operates.

Our Engineering Department will welcome the opportunity of discussing any grooving problem without obligation.

LYON MACHINE CO., WORCESTER 3, MASS.

it's on equipment, methods or personal relationships.

147 Keep calm; don't blow your top. Losing your head loses the respect of your men as well. Hold temperature down, so you can think sanely before giving a decision; then you can treat workers like fellow men.

148 Your job is to blend time, materials and people into a productive shift so you must watch the clock. You've got to be sure that time, materials and men come out even at shift-end. So, keep your eye on the clock, then your men won't be so disgusted or dispirited they'll watch the clock.

149 "I have yet to find the man, however exalted his station, who did not do better work and put forth greater effort under a spirit of approval than under a spirit of criticism."—*Charles M. Schwab.*

150 Said Thackeray: "Next to excellence is the appreciation of it." A sincere effort on your part to follow this basic idea will bring out greater efforts and performance from everyone around you. This is one way of getting better cooperation than money can.

151 You'll be a swell guy in the opinion of your subordinates if you're not too swelled in your own opinion. Regardless of rules and decisions, Americans still pick their leaders by common consent. If you can't lead, somebody else working for you will be the real leader of the "gang" that is your department.

152 Authority is an iron fist that's extremely sensitive at the edges. The slightest bruising gets it very irritated. That's why good bosses seldom use the fist; it's easily damaged.

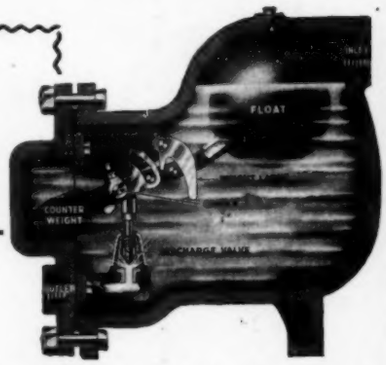
HOW DESIGN AFFECTS HEAT-TREATMENT—*CORRECTION*

Credit as to source was inadvertently omitted from the two Reference Book Sheets published in a recent number under the above title. The material was taken from the "Manual for Heat-Treating Services," compiled and published by the Metal Treating Institute, 420 Lexington Ave., New York 17, N. Y.

NICHOLSON WEIGHT OPERATED TRAPS

OFFER

A PRACTICAL WAY TO Protect All Air Tools and CUT "JAM TROUBLE"



Weight-operated for positive leak-proof action, Nicholson air traps offer dependable protection against corrosion and jamming of tools, and blemishing of parts caused by unwanted water and oil in air. Four types. Pressures to 1500 lbs. Stainless steel working parts. Catalog 444.

TWO TIME-TESTED TIME SAVERS BY NICHOLSON

Nicholson Expanding Mandrels save the time lost in making or looking for solid arbors. Set of 19 of these widely used tools does work of 209 solid arbors. For all bores, 1/2" to 7". Bulletin 1043.

Nicholson Control Valves are custom-constructed to suit specific pressures and mediums. Plant records show greater durability and savings in maintenance time. For all mediums. Pressures to 500 lbs. Catalog 546.

W. H. NICHOLSON & CO., 114 Oregon St., Wilkes-Barre, Pa.

OUND DESIGN + VIBRATION CONTROL = SUPERIOR PRODUCT

LORD
BONDED RUBBER
Shear Type
MOUNTINGS

Apply this simple formula to new products, particularly while in the blueprint stage, and watch its uncanny magic develop answers that bring a better product, lower manufacturing costs, and increased sales. Isolation of vibrational stresses frequently enables redesign for lighter weight, increases life of bearing surfaces, and protects vital parts.

Best of all, you will find the answer to your search for quicker and easier sales. Customers are enthusiastic when they find your usual high quality of performance coupled with new, *SMOOTHER* operation. Noise and vibration—the principal causes of industrial fatigue—no longer take their toll of efficiency and accuracy. Vibration Control cushions the nerves of industry.

For best results, bring your vibration problems to Vibration Control Headquarters. The service of LORD Vibration Engineers is yours for the asking. Write today for a vibration analysis of your new products.

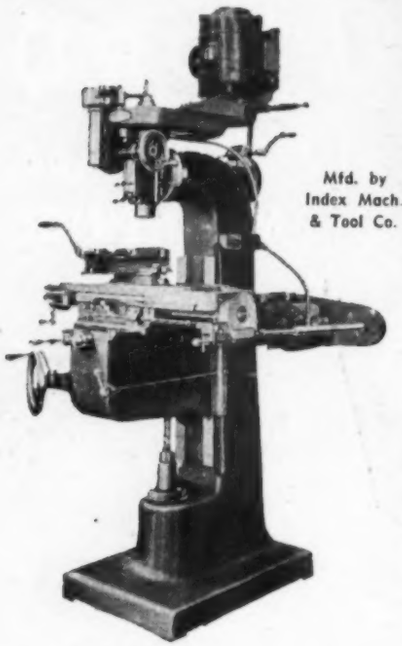
LORD MANUFACTURING COMPANY, ERIE, PA.

FIELD OFFICES { **New York, N.Y. Detroit, Mich. Washington, D. C. Chicago, Ill. Burbank, Cal.**
Canadian Representative: Railway & Power Engineering Corp., Ltd., Toronto, Canada.

Every genuine Lord Mounting carries the name "LORD" embossed in the rubber or in raised letters on the forgings.

INDEX MILLS

will help you on your tool, die and production work. In addition to micrometer dials on screws, verniers are standard equipment for cross and longitudinal locating. If finer precision is desired, rods and indicators are available. These in conjunction with power feed to a precision ball bearing spindle make a very versatile machine for milling, drilling and boring. *Literature promptly mailed on request.*



Mfd. by Index Mach. & Tool Co.

12" Tool Room Rotary Table

A quality tool for precision work in the tool room or production line, incorporating such features as ball bearings—hardened and ground worm—quick acting throw-out for free hand turning—single movement table lock that does not cramp table out of alignment—compound trough. 12" size only.

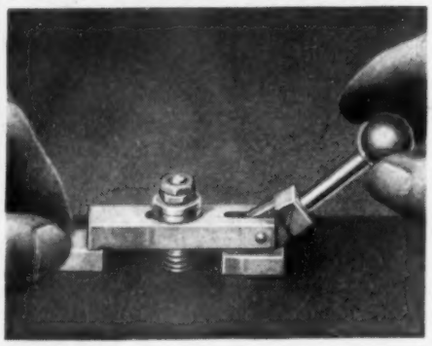
For use on Index Mills or any other machine that will accommodate a 12" table.

BLANK and BUXTON MACHINERY

3100 E. MICHIGAN AVE.
JACKSON, MICH.

WESPO MIGHTY MIDGET

QUICK ACTION FIXTURE CLAMP



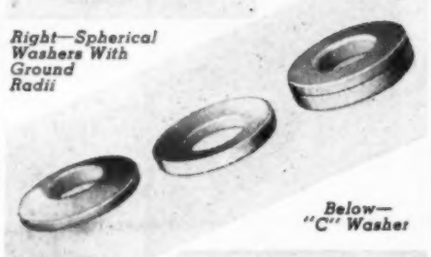
SAVE IN FIXTURE DESIGNING FOR SMALL WORK PIECES

WESPO Midget clamps also made in 3 other types. Larger clamps in 5 types—6 sizes each. All clamps are precision made from heat treated alloy steel, cadmium plated. Full scale template drawings of each model and size, as well as bulletin and prices, sent on request.

WESPO FIXTURE FITTINGS SAVE TIME AND MONEY

Left—Quarter Turn Screw

Right—Spherical Washers With Ground Radii



Below—"C" Washer

We make a complete line of WESPO fixture fittings. Keep a supply on hand—they cut designer's time and save ½ of your making cost. Precision made of heat treated alloy steels—cadmium plated. Full scale template drawings and prices on request.

WEST POINT MFG. CO.
19637 MERRIMAN COURT
FARMINGTON, MICH.

MODERN TESTING METHODS — What They Are... How to Use Them...

"Non-destructive Testing Methods", a 24-page *American Machinist* Special Report, gives all the facts on how to scientifically test parts, pieces, structural materials, rough castings, dies, and any other formed piece subject to defect.

This Special Report explains in detail the supersonic, radiographic, spectroscopic and magnetic methods of inspection . . . points out how each can be used effectively. Illustrations, graphs, photographs clarify the factual, authoritative text.

Non-destructive testing, recognized as the most practical way of checking on a production basis, is particularly important because a thorough check at all points is possible without damage to the part or material being tested. This compact, up-to-the-minute survey on non-destructive testing goes into the many new or improved methods used today, points out their particular advantages.

If you would like copies for distribution to your staff or for your own ready reference, we have a limited number available for distribution at 10¢ each.

Just write:

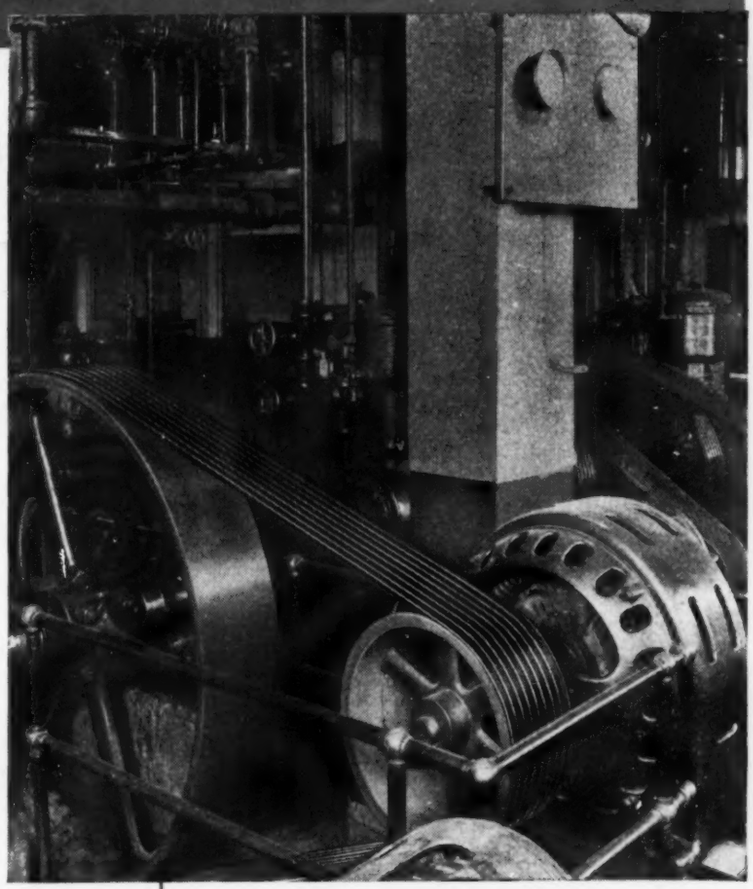
Reader Service Department

AMERICAN MACHINIST

Magazine of Metalworking Production

330 W. 42nd STREET
NEW YORK 18, N. Y.

WHY DAYTON V-BELTS *Save Space*

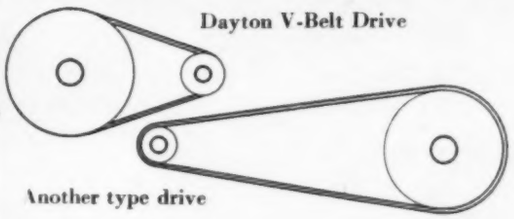


5 Compressors NOW... in Space Formerly Taken by *3*

In 1935, the superintendent of a large ice cream manufacturer found it necessary to install two additional compressor units in an already overcrowded power plant. He did it by replacing the original drives on three existing compressors with Dayton V-Belts. Because of the much shorter distances required from the center of the motor pulleys to the center of the compressor pulleys, enough floor space was saved to enable the superintendent to install the additional two much-needed machines! *Further savings were made by using the large flat pulley of the original drive.*

Dayton V-Belts save space because they have tremendous gripping power . . . need to contact only one-third of the pulley for efficient operation. Because of the smaller contact area required, machine and motor can be placed closer together, providing extra space for more machinery, wider aisles or for office or storage space. Space saving is one of many reasons why Dayton V-Belts can help solve your power transmission drive problems efficiently and economically. Get the full story from your Dayton Distributor. Call him today.

Dayton V-Belt Drive



Another type drive

In most cases, the distance required between the centers of the machine and motor pulleys for a Dayton V-Belt Drive is just about half that required for other types of drives.

THE DAYTON RUBBER MANUFACTURING COMPANY

Main Office and Factory: Dayton 1, Ohio

Branch Offices: Atlanta • Boston • Chicago • Cincinnati • Cleveland • Dallas Detroit • Los Angeles • Minneapolis • New York • Philadelphia • St. Louis

V-BELT BUYERS! A leading mill supply house near you stocks Dayton V-Belts . . Look for the name in the yellow pages of your telephone directory

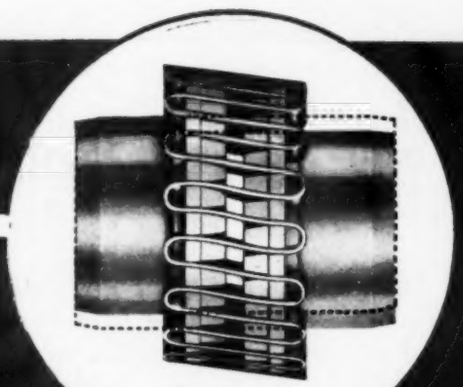
Dayton Rubber

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER

THE WORLD'S LARGEST MANUFACTURER OF V-BELTS

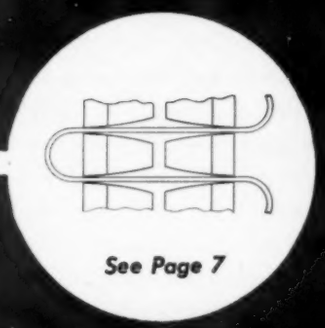
No Ad is large

you All the details of



See Page 9

It shows and tells you how the movement of the grid in the lubricated grooves comes into full play when parallel misalignment is involved. The misalignment is accommodated while still permitting full functioning of the grid-groove action of the coupling in absorbing shock and damping vibration. Also graphically shown on this page is the manner in which this Falk grid-groove design acts to accommodate angular misalignment and free end float.



See Page 7

On this page you will note how the grooves provide a slot for a grid member made of chrome alloy steel with an elastic limit of 180,000 pounds per square inch . . . an ultimate strength of 220,000 pounds per square inch, in addition to other features of the grid-groove design.

Send for This Book and *Get All the Facts!*

Falk Steelflex Couplings are designed to meet the needs for couplings for *any size* and *any service*. This book contains complete load classification tables, rating specifications and formulas for easy selection of Falk Steelflex Couplings for motor and turbine drives or engine drives. It also contains information on Falk flexible coupling for special service or dual-purpose applications. Send for it today.

TORSIONAL RESILIENCE

See Page 8

ALL STEEL CONSTRUCTION

See Page 7

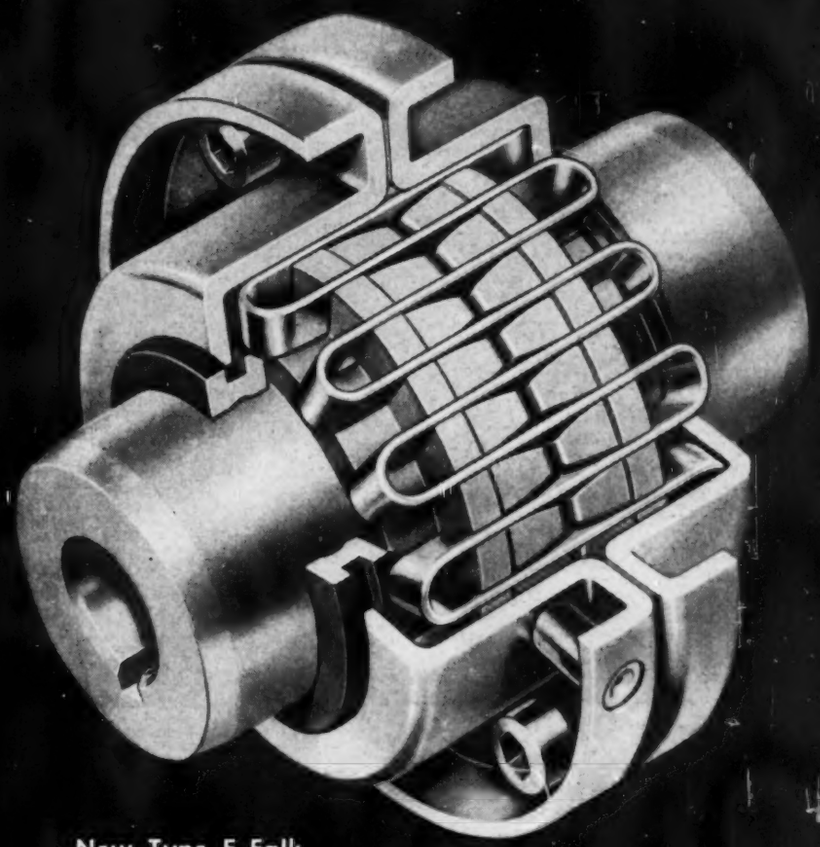
enough to give FALK Steelflex Couplings

● Falk Steelflex Couplings are the development of a company whose experience in gear design and power transmission dates back to 1892.

This experience has enabled Falk to produce a coupling that transmits power smoothly, dampens vibration, reduces shock, and cushions peak loads between the driving and driven member.

The Falk Grid-Groove design is the secret of the success of Falk Steelflex Couplings. It provides flexibility and torsional resilience to a degree not found in other couplings of this type. It provides the utmost compensation for both angular and parallel misalignment, also for free end float. This unusual combination of features has solved many otherwise tough coupling problems.

Falk Steelflex Couplings may be used in either a vertical or horizontal position. A new wide shoulder seal ring keeps the cover in position and protects against dust, dirt and loss of lubricant.



New Type F Falk Steelflex Coupling

It's the Grid-Groove design of Falk Steelflex Couplings that protects connected machinery from damaging shock and vibration, compensates for angular and parallel misalignment and provides torsional resilience.

THE FALK CORPORATION
MILWAUKEE 8 WISCONSIN

For over fifty years precision manufacturers of Speed Reducers . . . Motoreducers . . . Flexible Couplings . . . Herringbone and Single Helical Gears . . . Heavy Gear Drives . . . Marine Turbine and Diesel Gear Drives and Clutches . . . Steel Castings . . . Contract Welding and Machine Work.

District Offices, Representatives, or Distributors in principal cities.

FALK

. . . a good name in industry

THE FAMOUS *Red Elastic Collar* IS A SYMBOL OF SECURITY

It makes ESNA *Elastic Stop Nuts Self-Locking, Self-Sealing and Reusable*

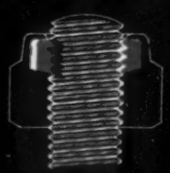
As a result, all ESNA Elastic Stop Nuts protect assemblies against the effects of: VIBRATION: Elastic Stop Nuts lock in position anywhere on a bolt or stud. Vibration, impact or stress reversal cannot disturb prestressed or positioned settings. . . . CORROSION: Elastic Stop Nuts keep the working threads on the bolt and nut bright and rust-free to protect their strength and permit easy removal without damage to the bolt. . . . THREAD FAILURE: Elastic Stop Nuts dampen impact stresses and materially reduce the shocks against bolt threads that frequently cause metal fatigue. . . . LIQUID SEEPAGE: Elastic Stop Nuts produce a radial-reactive pressure against the bolt threads inside the Red Elastic Collar that makes Elastic Stop Nuts self-sealing against liquid seepage. . . . COSTLY MAINTENANCE: Elastic Stop Nuts are reusable. (Torque tests on aircraft bolts prove that adequate locking torque is maintained through 15 on-and-off cycles.) They do not deform the bolt, damage the threads, gall the finish, or rust.

This wide range of protection permits full purchasing and inventory standardization and its resultant economy. For further information address: Elastic Stop Nut Corporation of America, Union, New Jersey. Sales Engineers and Distributors are conveniently located in many principal cities.

The RED ELASTIC COLLAR is . . .

PERMANENTLY CLINCHED to prevent turning under application and subsequent operational stresses.

PERMANENTLY SECURE against vibration effects. The bolt impresses (does not cut) full contact threads.



PERMANENTLY TIGHT against moisture. Bolt threads have 100% contact in collar — and a full metal seat.

REUSABLE. The Red Elastic Collar retains its grip after repeated usage.

ESNA ELASTIC STOP NUTS

TRADE MARK

INTERNAL WRENCHING

ANCHOR

WING

SPLINE

CLINCH

GANG CHANNEL

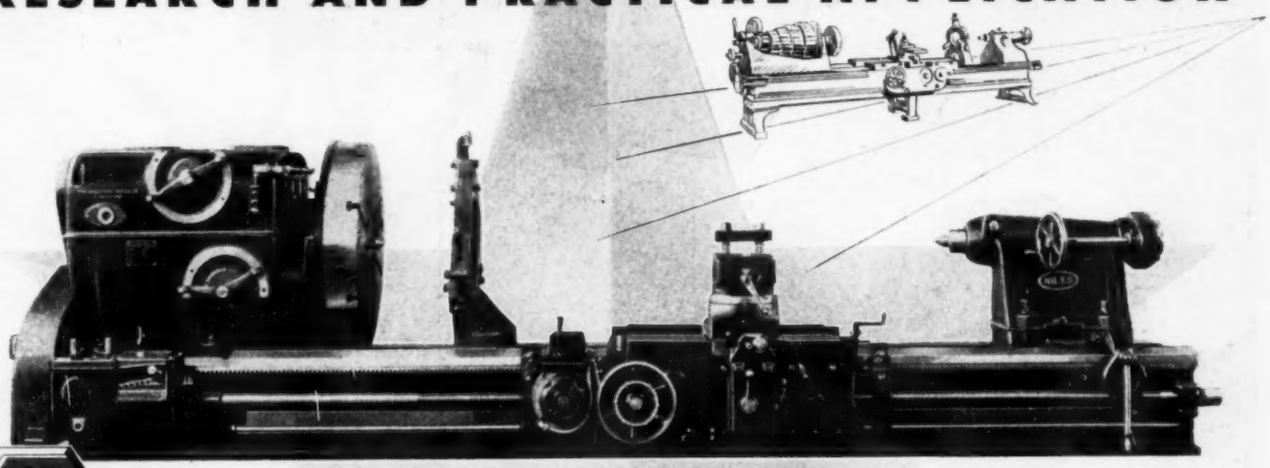
CAP

PRODUCTS OF: ELASTIC STOP NUT CORPORATION OF AMERICA

GENERAL MACHINERY CORPORATION

HAMILTON, OHIO

PROGRESS THROUGH 100 YEARS OF RESEARCH AND PRACTICAL APPLICATION



NILES 60" HEAVY ENGINE LATHE

NILES

Check these features . . .

1. Heavy, massive bed extending to the floor line.
2. Compensating V-type Bed ways.
3. Anti-friction bearings throughout Headstock.
4. Hardened and ground Headstock gears.
5. Off-center Spindle.
6. Internal Ring Gear Drive to Face-plate.
7. Automatic flood lubrication to all moving parts.
8. Positive fine-tooth feed clutches in apron.
9. Double-walled apron to support all shafts at both ends.
10. Interlock between Feed and Thread engaging levers.

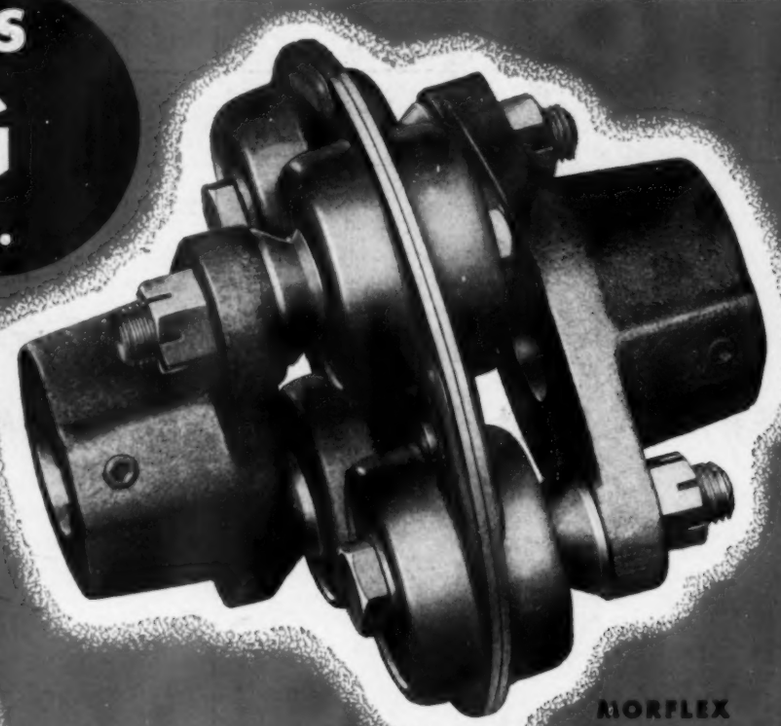
Write Dept. C for this catalog covering the complete line of Niles tools, and other products made by General Machinery Corporation.

SUBSIDIARIES: ★THE NILES TOOL WORKS COMPANY ★PUTNAM MACHINE COMPANY ★THE HOOVEN, OWENS, RENTSCHLER CO. ★THE HAMILTON PRESS AND MACHINERY CO. ★THE UNITED WELDING COMPANY

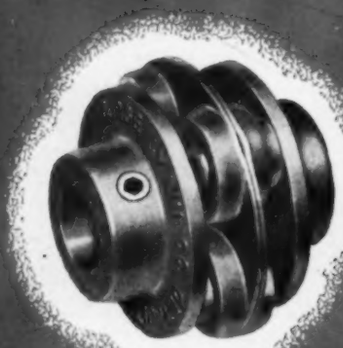
PRODUCTS: ★MACHINE TOOLS ★DIESEL AND STEAM ENGINES ★PRESSES ★CAN MAKING MACHINERY ★SPECIAL MACHINERY

Five Star Leadership

COUPLINGS FOR BIG JOBS . . .

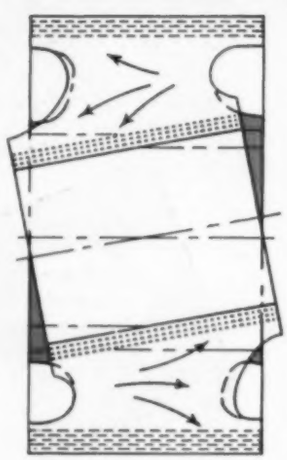


MORFLEX



MORFLEX JUNIOR

and LITTLE JOBS



Specially-shaped Neoprene biscuits, pre-loaded in assembly, distribute uniform stress throughout their volume under all conditions. Arrows indicate deflection as biscuit compensates for angular misalignment of connected shaft.

MORFLEX COUPLINGS

Cushion Shock, Isolate Vibration Prolong Machine Life

Morflex Couplings, available in 12 sizes of 3 to 725 foot pounds torque capacity, protect big machine installations and fractional horsepower applications alike.

The exclusively Morse-designed Neoprene biscuit assembly permits maximum smooth power delivery, isolates uneven impulses for longer machine life.

Morflex Couplings require no lubrication. They're clean—do not soil products, and are unaffected by oil, dirt or weather.

MORSE CHAIN COMPANY • Detroit 8, Michigan • Ithaca, N. Y.

MORSE

MECHANICAL POWER TRANSMISSION PRODUCTS

A PRODUCT OF B-W BORG-WARNER

Read why

INDUSTRY'S Fastening-wise LEADERS CHOOSE PHILLIPS SCREWS

INDEPENDENT STUDIES! AUTHENTIC! UNBIASED! Prepared by investigators from the James O. Peck Co., industrial research authorities, who talked with key men in top U. S. plants using Phillips Recessed Head Screws in product assembly.

"Assembly savings 50%" . . . "Breakage reduced 90%" . . . "Eliminate $40.-a-day spoilage." In their own words, America's best assembly men tell how they apply the proved advantages of Phillips Screws to speed driving, end driver skids, eliminate unsightly burrs, improve product appearance.

Each report is fully illustrated – a fact-jammed digest of modern assembly practice, information you never hoped to see in print, inside facts you would pay good money to get – now, FREE, to you.

12 Reports Now Ready

These reports have been offered as they were published throughout the year. If you haven't already sent for them, get all twelve now. Read them! Learn why, more and more, Phillips Screws spot the profit-planned products!

- HEYWOOD-WAKEFIELD . . .
- EMERSON RADIO . . . . . .
- SONOTONE CORP. . . . . .
- BENDIX APPLIANCES . . . . .
- PULLMAN-STANDARD . . . .
- SERVEL, INC. . . . . .
- OTIS ELEVATOR . . . . . .
- NORTON CO. . . . . .
- PITNEY-BOWES . . . . . .
- YORK CORP. . . . . .
- PIPER AIRCRAFT . . . . . .
- LIONEL CORP. . . . . .

Mail the coupon NOW!

PHILLIPS *Recessed Head* SCREWS

Wood Screws • Machine Screws • Self-tapping Screws • Stove Bolts

American Screw Co.
Atlantic Screw Works
Atlas Bolt & Screw Co.
Central Screw Co.
Chandler Products Corp.
Continental Screw Co.
Corbin Screw Div. of American Hdwe. Corp.
The H. M. Harper Co.
International Screw Co.
Lamson & Sessions Co.

26 SOURCES

Milford Rivet and Machine Co.
National Lock Co.
National Screw & Mfg. Co.
New England Screw Co.
Parker-Kalon Corporation
Pawtucket Screw Co.
Pheoll Manufacturing Co.
Reading Screw Co.
Russell Burdsall & Ward Bolt & Nut Co.
Scovill Manufacturing Co.
Shakeproof Inc.
The Southington Hardware Mfg. Co.
The Steel Company of Canada, Ltd.
Sterling Bolt Co.
Stronghold Screw Products, Inc.
Wolverine Bolt Company

AM-13

Phillips Screw Mfrs.,
c/o Horton-Noyes
2300 Industrial Trust Bldg., Providence, R. I.

Send me the 12 Assembly Reports on Phillips Screws.

Name.....

Company.....

Address.....

.....

LET LESS METAL MAKE MORE MONEY

It's expensive to hold a mechanism in place with unnecessarily big shoulders or collars,—or to temporize with small cotter pins, etc. Let us show you how spring steel retaining rings can do a thoroughly efficient job for you.

More and more retaining rings are being used in these days of necessary economy. Every ounce of metal and every cent of cost is more important today than ever before.

It is needless waste in most instances to turn your shoulders by cutting down larger shafts, when you can groove a smaller shaft and apply a spring steel retaining ring. You'll get excellent results at unbelievable savings.

Every shoulder on your machines or on your metal products should be examined to see whether or not smart engineering could take advantage of these modern artificial shoulders on shafts or in housings.

Write today for our descriptive folder on Retaining Rings.

THE NATIONAL LOCK WASHER COMPANY
Newark, N.J., Milwaukee, Wisc., U.S.A.

HAVING TROUBLES?

Your Bearing problems are our business.

Rano Bronze Corp.
PRECISION BRONZE BEARINGS
Clearfield and Witte Streets
Philadelphia 34, Penna.

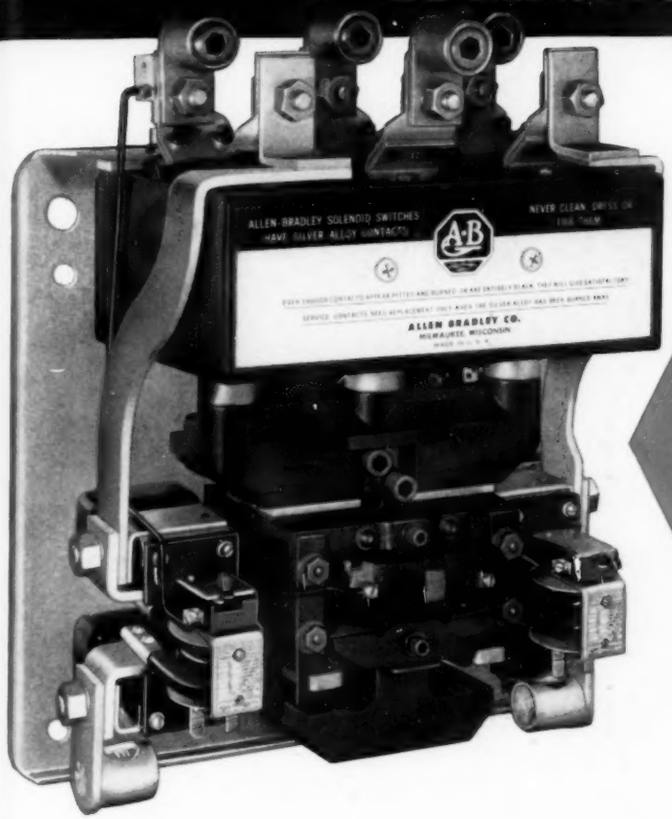
We welcome the opportunity to quote you on your prints; production runs our specialty.

Sandblasting
IS ECONOMICAL IF THE NOZZLE LIVES 1,500 HOURS *this one does*

VERALOY
CEMENTED CARBIDE

VERALOY PRODUCTS LTD
THE MARSH · HIGH WYCOMBE · BUCKS · ENGLAND

ON TEST. 5,721,098 OPERATIONS before failure!



NEW SIZE 5 Bulletin 709 SOLENOID STARTER Shows Amazing Ruggedness in Life Tests

Now . . . Solenoid Construction . . . with all its Advantages . . . in a 300-Ampere Starter

In actual mechanical life test, the new Allen-Bradley Size 5 solenoid starter operated 5,721,098 times before a minor failure occurred. This amazing test proves the inherent ruggedness and long life of this new solenoid starter—a life span heretofore unheard of in a 300-ampere starter!

The New Size 5 solenoid starter has all the proved advantages of Allen-Bradley solenoid design—simple construction . . . maintenance-free, double break, silver alloy contacts . . . compact, self-contained switch mechanism. This starter will bring you the same astounding results in a 300-ampere switch as you have been enjoying in Allen-Bradley solenoid starters of smaller capacity. Therefore, for your large motors, specify this new solenoid starter.

Bulletin 709, Size 5 solenoid starter in its attractive, NEMA Type 1, sheet metal enclosure with white interior.

A-B Quality

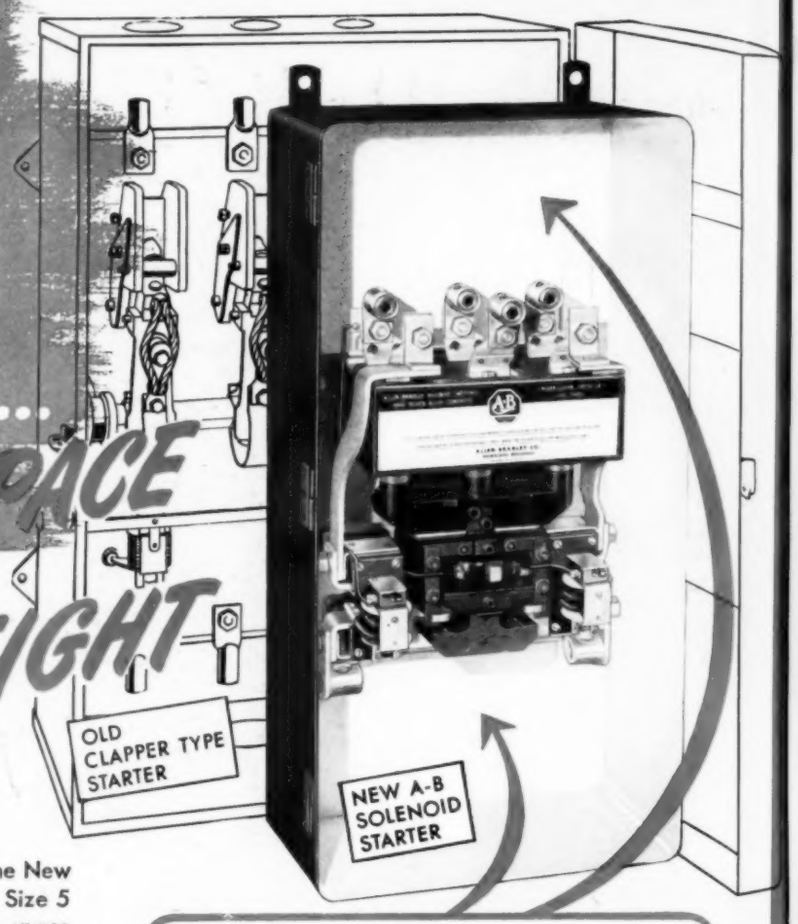
ALLEN-BRADLEY
SOLENOID MOTOR CONTROL

QUALITY

NEW SIZE 5 Bulletin 709 SOLENOID STARTER takes...

46% LESS SPACE

50% LESS WEIGHT



Put a conventional clapper type starter up against the New Size 5 solenoid starter. Notice the difference! The New Size 5 is much smaller and lighter. Yet it provides much more space for wiring, and will outperform the clapper starter. It is more rugged and reliable . . . has a greater current interrupting capacity . . . is easier to install . . . is practically maintenance-free. Each pole of the New Size 5 solenoid starter is enclosed in an individual arc chamber which confines the arc and prevents flashover. This new unit will easily interrupt ten times its maximum horsepower rating. Following are a few of its other advantages:

UNIT CONSTRUCTION

All parts are assembled on a steel base plate and insulated from it. The starter can be mounted as a unit directly on any metal surface without extra insulation. All terminals are readily accessible from the front.

NO CONTACT MAINTENANCE

Patented double break, silver alloy contacts are used. Oxides that may form on these contacts are good electrical conductors. Hence, they never require filing or dressing, and valuable contact life is not wasted.

ONLY ONE MOVING PART

The only moving part in this starter is the solenoid plunger which moves up and down in a phosphor bronze guide, practically without friction. There are no pins, pivots, or hinges to corrode or gum up. No flexible jumpers to cause trouble or delay switch action.

Allen-Bradley Company
1316 S. Second St., Milwaukee 4, Wisconsin

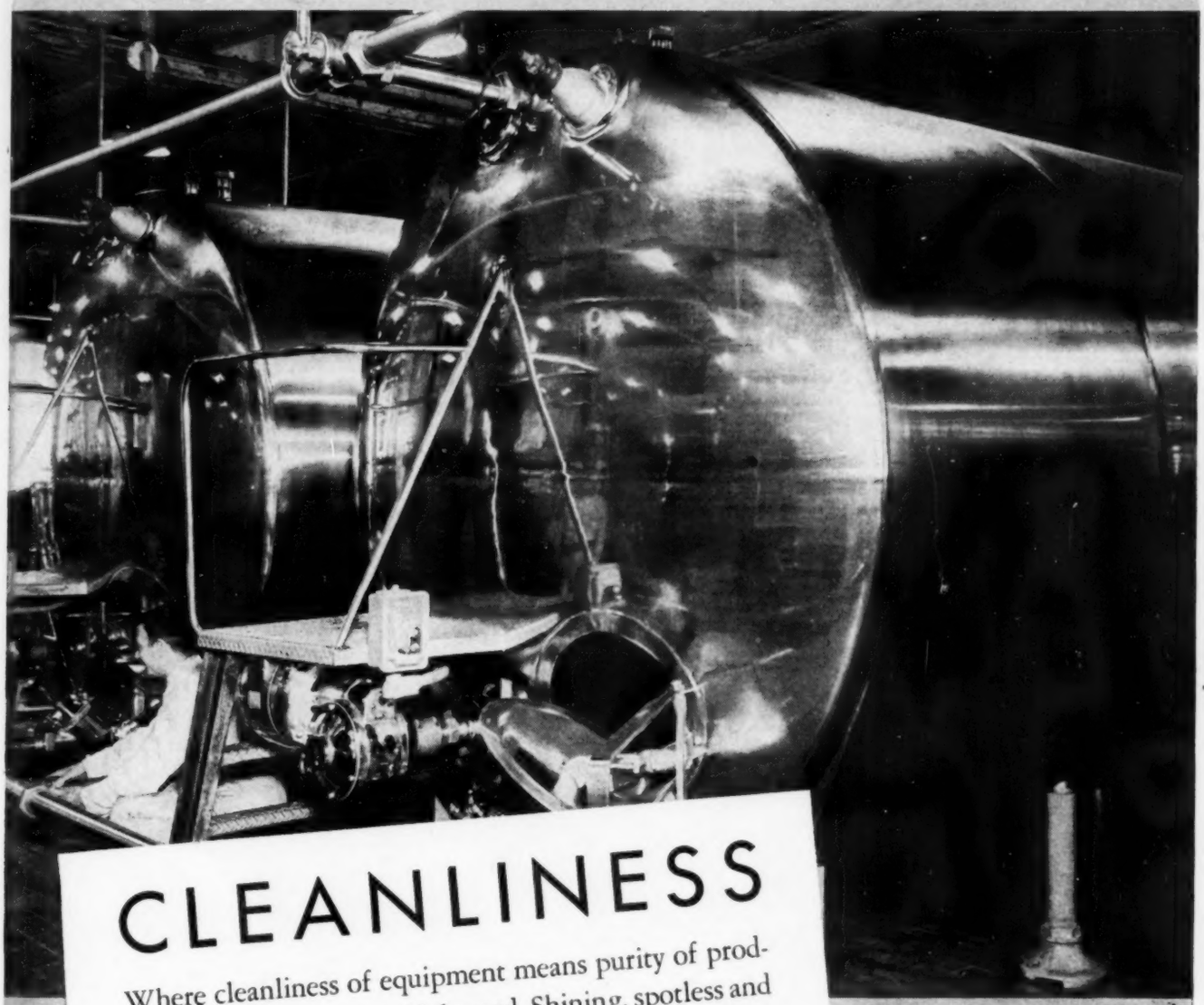
LARGER SPACE FOR WIRING, TOO

A-B Quality

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL

CHROMIUM-NICKEL AUSTENITIC STAINLESS STEELS

Most versatile of modern metals . . . their unique combinations of properties merit your consideration in designing for the future.

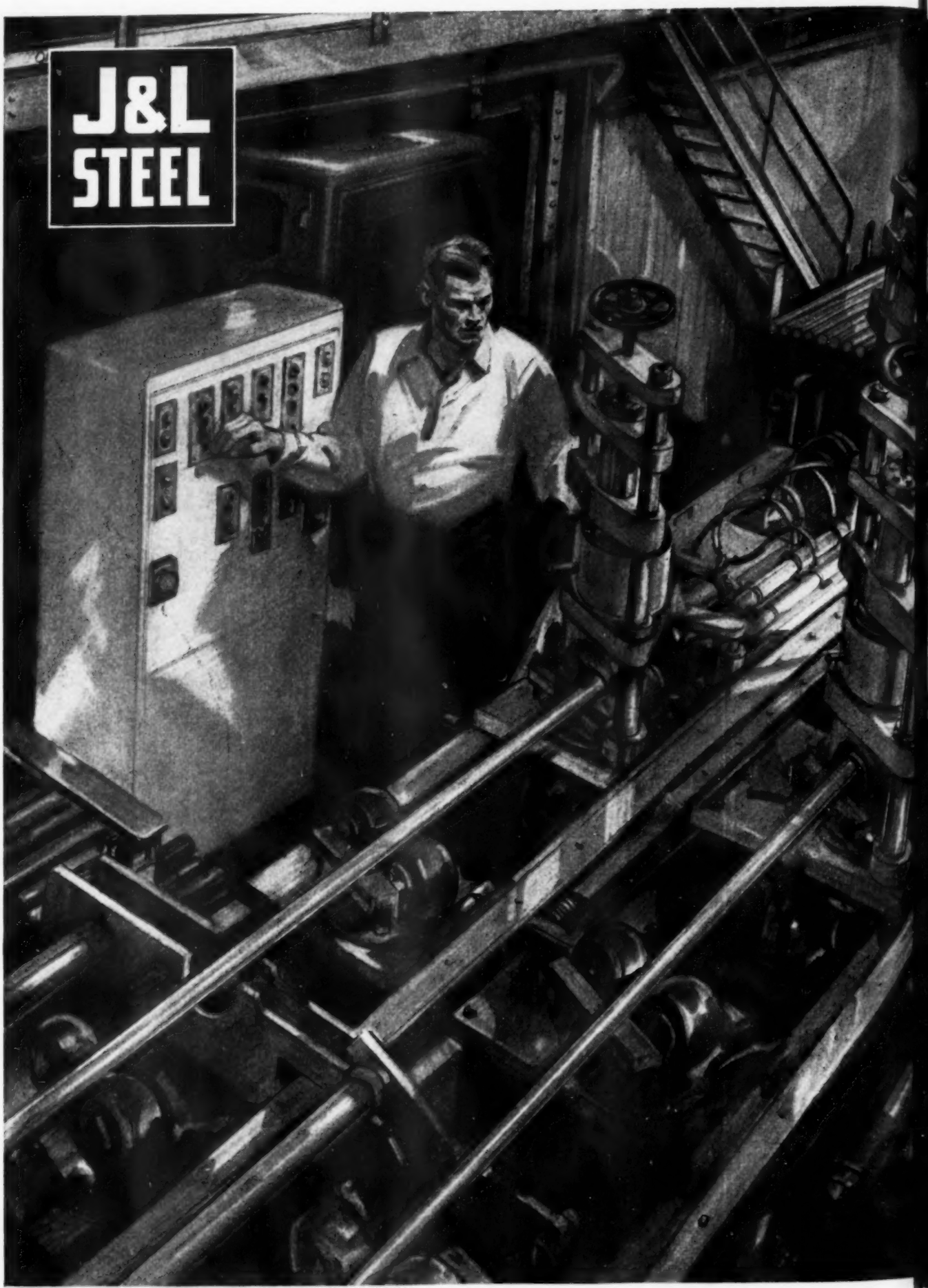


CLEANLINESS

Where cleanliness of equipment means purity of product, stainless steels are widely used. Shining, spotless and hygienic, inside and out, these chromium-Nickel stainless steel milk storage tanks guard purity at Sheffield Farms Co., Inc., Division of National Dairy Products Corp., Jamaica, Long Island, N. Y.

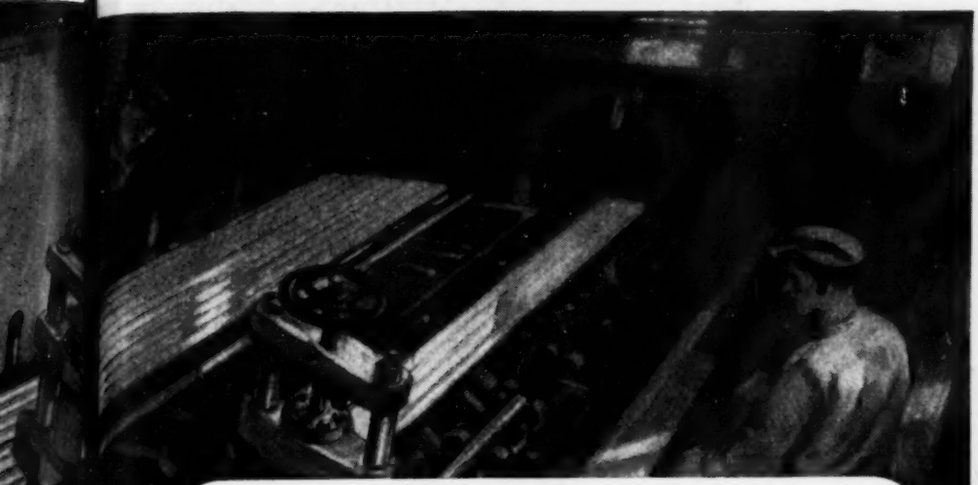
International Nickel are miners, smelters, and refiners of Nickel, an important ingredient in the chromium-Nickel austenitic stainless steels. Although they do not produce these stainless steels, a list of the sources of supply will be furnished on request.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N.Y.



DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON

Advertisement



NOW, ELECTRONICS GOES TO WORK FOR J&L TO HEAT TREAT COLD FINISHED STEEL UNIFORMLY

Electronics, a fast, powerful, new industrial servant, has been put to work by Jones & Laughlin Steel Corporation in the electric induction heat treatment of cold finished steel bars for the first time by any steel producer. These new "Electreat" steel bars have a degree of uniformity not achieved by conventional furnace heating and tank quenching methods.

In the J&L "Electreat" process each bar is heated and quenched individually in exactly the same length of time as other bars in the lot. This is accomplished through the unusually accurate control of heating and quenching provided by the induction method. Yet "Electreat" bars retain their sectional accuracy and quality surface. Induction heating also keeps to a minimum decarburization which may cause uneven wear in a finished part. "Electreat" bars in a variety of sizes are available in a wide range of quenched and tempered treatments.

Application of induction heating to provide uniform cold finished bars with better physical properties accents J&L's leadership in cold finishing steel, invented by J&L and patented in 1859.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH

"ELECTREAT" STEEL

Smart design and production engineers step up their production and cut out costly heat treating operations by using quenched and tempered cold finished steel for parts of autos, domestic appliances, business machines and many other applications. By using bars heat treated for them in the steel mills they gain advantages of increased strength, ductility, hardness, toughness without necessity of heat treating the finished part in their own plants. This also removes possibility of distorting the article after intricate machining work has been completed. They now will find that J&L "Electreat" bars give them additional advantage of increased uniformity over conventional heat treated bars.

Cold finishing, patented by J&L in 1859, improves size accuracy, surface, and physical characteristics of hot rolled steel bars. All the advantages of cold finished steel are retained in J&L "Electreat" process.

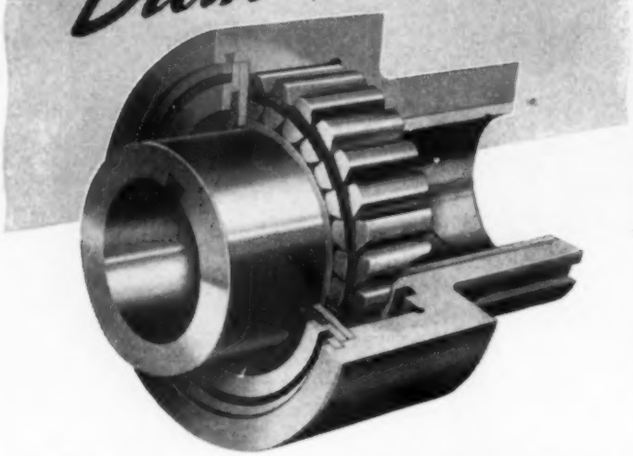
Electronic principle of transformer is used in "Electreat" induction heating method. High frequency electric current flowing through a coil transfers to the bar passed through it. The resistance of the bar to the current causes heating to take place with extreme rapidity. In "Electreat" process the bars are fed continuously through an induction coil. Depending upon their size and desired temperature, they are heated in 15 to 25 seconds to about 1600 degrees F. The coil itself, which does not come in contact with the bar, remains cool. In fact, you could place your hand inside and not feel heat, yet if you had on a metal ring it would be melted instantly. When the bars leave the coil they pass through a cone of water sprays which strike the steel at high pressure. This produces a rapid rate of cooling to harden the steel. In cases where this more severe quench will fully harden the section it may be possible to substitute plain carbon steel for a low alloy steel.

Steel can be quenched in many mediums, including air, water, brine, molten salts and various light and heavy oils.

Heat treatment is ancient art, was practiced by mystics and alchemists of the Middle Ages in fashioning armor and swords. Centuries later the village smith still depended upon his sense of color for his crude but no longer mystic heat treatment. He heated steel in forge to dull red, cherry, or orange, plunged it into oil or water and determined by filing or scratching if steel was quenched to proper hardness.

Father of modern heat treating was Henri le Chatelier (1850-1936) who discovered many new facts about the effect of heating and cooling steel. He started the advancement of heat treating from a hit-and-miss art to an exact science.

We Ourselves Didn't Realize



—there were so many applications demanding a really good over-running clutch

FORMSPRAG

THE FULL COMPLEMENT
Over-Running Clutch

The basic principle of this clutch—a *full* complement of sprags, not just a few—has been adapted for many types of industrial application, particularly where large torque capacity must be confined to a small space. New engineering development now enables us to do things considered impossible a year ago. For instance, we now have a clutch in which centrifugal force pulls the sprags entirely free from the inner race at the normally over-running high speeds, providing frictionless performance.

In cloth dipping, where cloth is wound from one roller to another—and reversed—a new Formsprag permits a single motor to drive both rollers, compensating for the ever changing diameters.

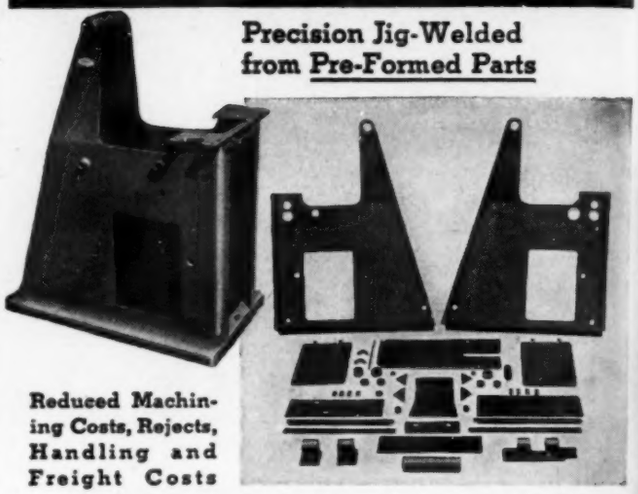
It's really worth investigating if you have, or may have, an application.

Formerly manufactured by
THE GEAR GRINDING MACHINE CO.
Now manufactured by

FORMSPRAG Company
1415 JARVIS • FERNDALE, MICH.

WELDED MACHINE BASES

Precision Jig-Welded from Pre-Formed Parts



Reduced Machining Costs, Rejects, Handling and Freight Costs

Completely replacing heavy, unreliable castings, Fab-Welded Machine Frames and Bases of intricate design are built up from accurately made parts, jig-welded, and produced on a quantity basis.

Ask Our Engineering Department for Suggestions

FAB-WELD CORPORATION
3640 RICHMOND ST., PHILA. 34, PA. Phone REgent 9-4807

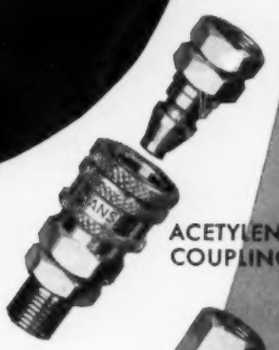
PUT AN END TO YOUR QUESTION

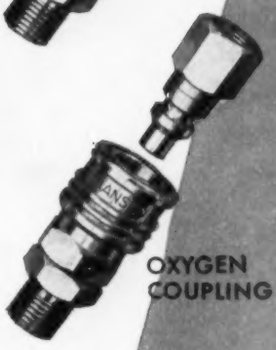
SPECIFY "ABBOTT"

BEARING BALLS

THE ABBOTT BALL COMPANY HARTFORD, CONN. U.S.A.

HANSEN *Couplings*
Are Used On a VARIETY of JOBS





EACH DAY a new use is found for Hansen couplings, proving their adaptability, versatility and right design. Hansen couplings have made their mark in many fields and their long list of accomplishments is growing longer each day.

There is a specific Hansen coupling made for air, oil, grease, oxygen, and acetylene, and they come in a wide range of standard sizes.

Hansen couplings are simple and easy to operate — merely push plug into socket, coupling is connected and locked — slide sleeve back with thumb, coupling is unlocked and disconnected. Hansen couplings are rugged, with all moving parts fully protected, consequently they will stand up under rough usage. Complete swivel action prevents kinking of hose. They can be readily incorporated in new or existing equipment.

Our representatives will be glad to discuss with your engineers the possibilities and many advantages of Hansen couplings. Send for illustrated catalog.

AIR, OIL—GREASE COUPLING

REPRESENTATIVES

New England States:
A. D. GEIGER, Belmont, Mass.

Eastern, Southern States:
B-R ENGRG. CO., Baltimore, Md.

Northern Ohio:
F. & W. URSEM CO., Cleveland, O.

Southern Ohio, West Va., Ky.:
STEINHAGEN AIRLINE PRODUCTS, Dayton, O.

Northern Ill., Eastern Iowa:
NORRIS ENGRG. CO., Chicago, Ill.

Indiana, Wisconsin:
HEFF ENGRG. CO., Ft. Wayne, Ind.

Central Western States:
JOHN HENRY FOSTER CO., St. Louis, Mo., Minneapolis, Minn.

Western, Southwestern States:
BURKLYN CO., Los Angeles, Calif.

Northern Calif., Nevada:
H. E. LINNEY CO., Oakland, Calif.

Michigan:
WM. H. NASH CO., Detroit, Mich.

E HANSEN MANUFACTURING CO.
EAST 27th STREET • CLEVELAND 14, OHIO

Expect the Exceptional

FROM

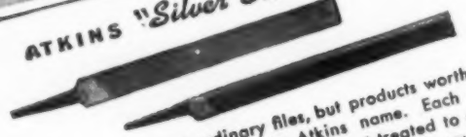
ATKINS

"Silver Steel" BLADES

IMPORTANT TO USERS

Use Atkins "Silver Steel" Hacksaw Blades in connection with any tensioning device now available—they will perform with complete satisfaction.

ATKINS *"Silver Steel"* FILES



Atkins Files are not ordinary files, but products worthy in every respect to carry the Atkins name. Each is made of famous "Silver Steel"... heat-treated to assure sharper cutting for a longer time... rigorously tested to certify final perfection. There's an Atkins "Silver Steel" File to meet every need.

You can scrap all previous metal cutting job standards when you switch to Atkins "Silver Steel" blades—it's a *proved* change for the better.

For one thing, it's a change-over to the *only* hacksaw machine blade with "Curled Chip" teeth. That means speedier, more accurate cutting...far longer cutting periods for every blade...higher cutting efficiency at lower costs for every metal cutting job. These are typical of many Atkins advantages—*verified* by actual case studies* in leading plants.

But most important, you can *know* in advance what savings a change to Atkins offers *you*. Just say you want an actual demonstration of Atkins cutting superiority on material you choose—an Atkins Cutting Engineer is ready to help. *Write for details today.*

*(Typical reports, of many on record, available on request.)

See Your Industrial Supply Distributor or Write to:

E. C. ATKINS AND COMPANY

Home Office and Factory:
402 South Illinois Street, Indianapolis 9, Indiana
***Branch Factory:* Portland, Oregon**
***Branch Offices:* ATLANTA • CHICAGO • MEMPHIS**
NEW ORLEANS • NEW YORK • SAN FRANCISCO

ATKINS

ATKINS BLADES TAKE THE "HACK" OUT OF HACKSAWING

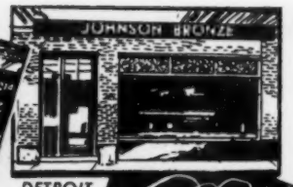
BRANCHES IN 18 INDUSTRIAL CENTERS

JOHNSON BRONZE

SLEEVE BEARING HEADQUARTERS

AS CLOSE AS YOUR PHONE

ST. LOUIS



DETROIT

DALLAS

SEATTLE

PHILADELPHIA

KANSAS CITY, MO.

NEW YORK

ATLANTA

MINNEAPOLIS

CAMBRIDGE, MASS.

PITTSBURGH

CINCINNATI

BUFFALO

NEWARK

CHICAGO

CLEVELAND

SAN FRANCISCO

LOS ANGELES

MANUFACTURERS like to depend on Johnson Bronze for their Sleeve Bearings because of the quality product and our friendly, convenient service. It makes little difference where you are located, you will find a factory trained Johnson Bronze man *as near as your telephone.*

On bearings made to your specifications he is ready, willing and capable to answer your questions regarding the various types and their proper use. For replacement, he places at your disposal complete stocks of automotive and industrial bearings, electric motor bearings, UNIVERSAL Bronze Bars, and Babbitt. Or he will gladly give you the name and address of your local Johnson Distributor.

Isn't this the type of bearing service you can use? Why not plan now to depend on Johnson Bronze? Take full advantage of our more than forty years exclusive bearing experience. Remember, that only Johnson Bronze makes *every* type of Sleeve Bearing.

JOHNSON BRONZE COMPANY
515 S. MILL ST. —— NEW CASTLE, PA.

GENERAL-PURPOSE BEARINGS

ELECTRIC MOTOR BEARINGS

UNIVERSAL BRONZE BARS

LEDALOYL BEARINGS

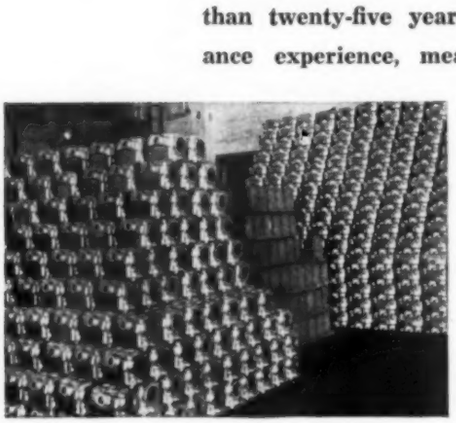
AUTOMOTIVE BEARINGS

EVERYTHING YOU NEED IN *SLEEVE TYPE BEARINGS*

• MILLIONTHS OF AN INCH FOR SALE •

Don't Drive Your Production Manager Nuts!

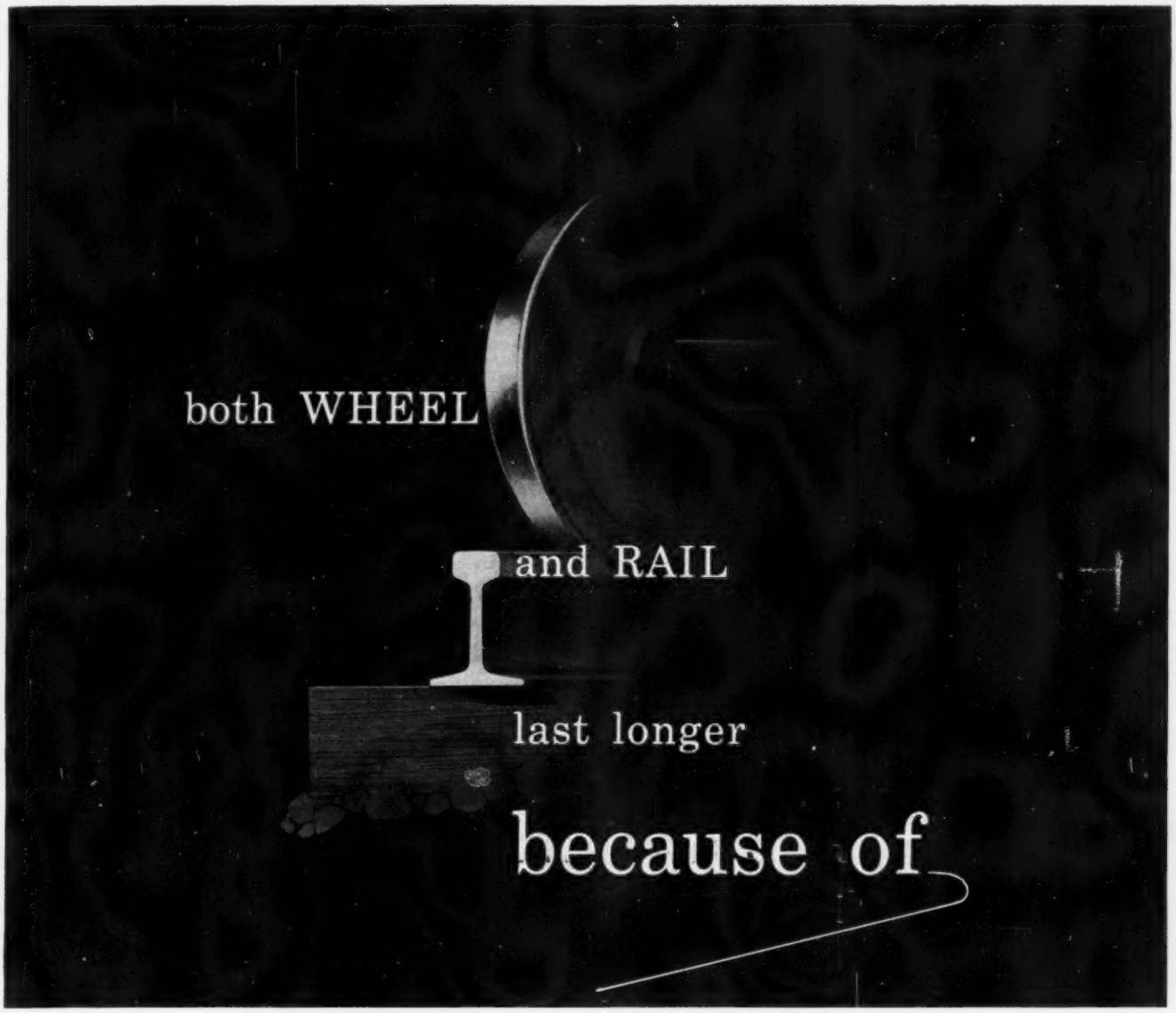
The failure of close tolerance parts to assemble correctly, resulting in scrap, reworking and vanishing profits is a nightmare. We, at VINCO, have a sure cure for such a malady—"PRECISION WISDOM" "PRECISION WISDOM", the result of more than twenty-five years of close tolerance experience, means VINCO can economically mass produce, for you, complicated parts and assemblies having "tenth" tolerances and micro-inch surface finishes. Call on VINCO to handle your next precision production job and learn what "PRECISION WISDOM" can do for you. We are as close as your telephone.



Mass Production of machined parts, such as those shown at the left, is done in Plant 2. Here parts, having wider tolerances than those above, are handled by skilled workmen operating modern equipment. Thousands of pieces leave Plant 2 daily on their way to our satisfied customers. Why don't you try VINCO Service at your earliest opportunity?

VINCO CORPORATION
8855 Schaefer Hwy. • Detroit 27, Michigan

VINCO for EXCELLENCE



WHAT MOLYBDENUM DOES FOR STEEL

Thorough tests carried on for many months by one of the most enterprising of American railroads, prove that Molybdenum-alloyed steels give greater wear resistance to rails as well as locomotive wheels and car wheels, and prolong the useful life of both wheel and rail. The Molybdenum addition recommended is small and the resulting improvement is out of all proportion to the slight increase of cost. Detailed information is available.

The Molybdenum Corporation, as a supplier of Molybdenum, Tungsten, Boron, and other alloying materials, welcomes the inquiries of any user.

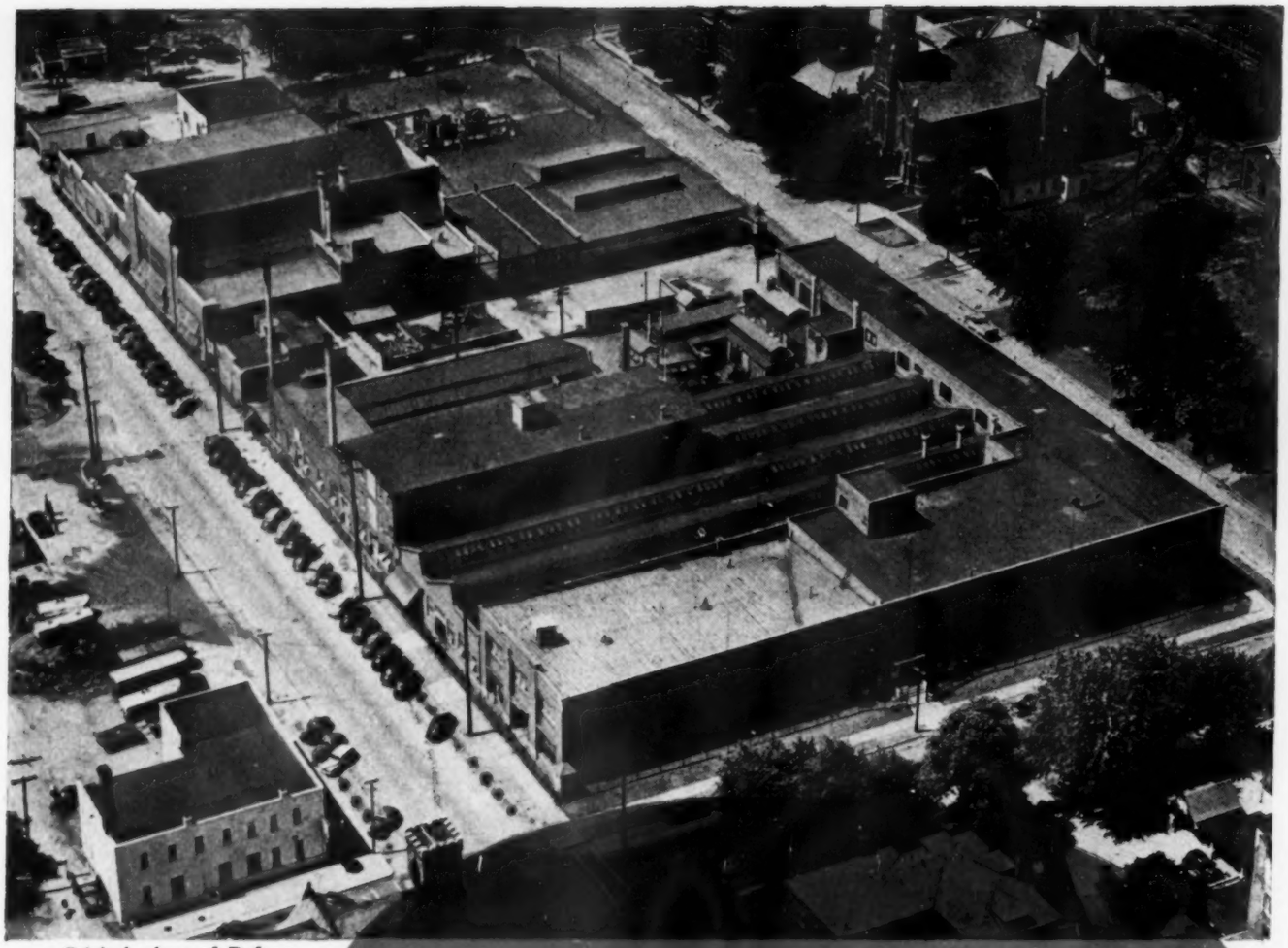
MASTER CRAFT ALLOYS

AMERICAN Production, American Distribution, American Control, Completely Integrated.
Offices: Pittsburgh, New York, Chicago, Cleveland, Detroit, Los Angeles, San Francisco, Seattle.
Sales Representatives: Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco, Seattle.
Subsidiaries: Cleveland-Tungsten, Inc., Cleveland, O.; General Tungsten Manufacturing Co., Inc., Union City, N. J.
Works: Washington, Pa.; York, Pa.
Mines: Questa, New Mexico; Urad, Colorado.

MOLYBDENUM

CORPORATION OF AMERICA
GRANT BUILDING PITTSBURGH, PA.

MCA



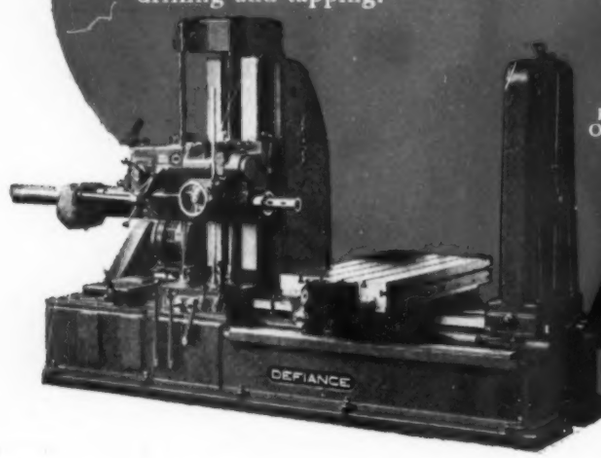
Original plant of Defiance, used in 1850, still stands. It is the small building at lower left of photo. Across the street is the large modern plant for present-day operations.

. . . WHERE PRECISION HAS RULED for 97 YEARS!

Way back before Civil War days . . . Defiance built precision machines for wood-turning. These were used to help produce the fine carriages and wagons of that era.

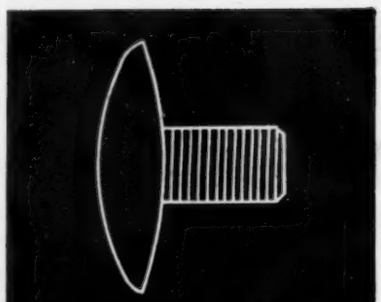
Then came the Age of Metal—and Defiance Engineers turned their talents and experience to developing heavy machines for boring, milling, drilling and tapping.

Today—the entire manufacturing layout and operations at Defiance are planned and tooled for the highest type of *accuracy* and *efficiency*. Defiance Engineering is forward-thinking . . . continuing to pioneer new developments in machines with all the know-how and experience of 97 years. Defiance Machine Works, Inc., Defiance, Ohio.



Defiance No. 25A Horizontal Boring Machine is designed with outboard bearing supports allowing maximum cross travel without sag. It has a 3¼" bar . . . 20 speeds range from 12 R. P. M. to 1000 R. P. M. . . . 30" x 60" table. Oversize construction insures rigidity.

DEFIANCE
BORING . . . MILLING . . .
DRILLING . . . TAPPING *Machines*

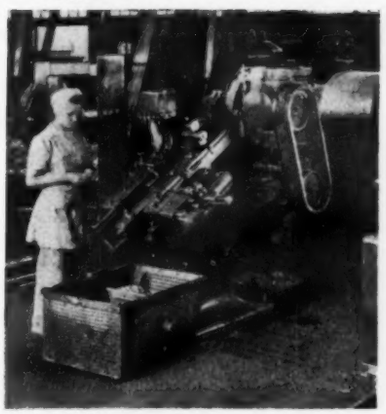


LITTLE BOLTS DO BIG JOBS

for the Automotive Industry

One of the world's greatest, most progressive industries, the American automotive industry is a tremendous purchaser of nuts and bolts of all sizes and shapes . . . standards and specials. Typical are the bumper bolts (illustrated) . . . small but obviously vital fasteners . . . produced by Buffalo Bolt Company for one of our nation's largest manufacturers.

Standard or special, all circle Ⓑ products have the same uniform controlled quality that serves to make your production more efficient . . . less costly.



DID YOU KNOW *that each machine in this battery of Buffalo Bolt roll threaders has a capacity of 43,000 bolts per working day?*

Ⓑ BUFFALO BOLT COMPANY

NORTH TONAWANDA, N. Y. · SALES OFFICES IN PRINCIPAL CITIES

Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

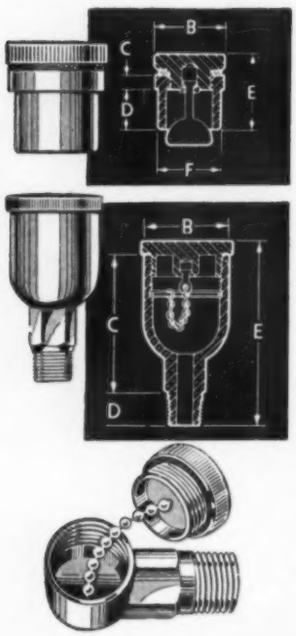
Mac-it ALLOY STEEL SCREWS

GET POSITIVE LOCKING ACTION with MAC-IT HOLLOW LOCK SCREWS!

Mac-it Hollow Lock Screws provide a locking arrangement that combines convenience with positive locking action. They lock as effectively after many thousand adjustments as they do the first time. *All* Mac-it screws are heat-treated and accurately made with die-cut threads. Whatever your needs, let the *complete* Mac-it line serve you. Sold through recognized distributors from coast to coast and in Canada.

DISTRIBUTED NATIONALLY BY
STRONG, CARLISLE & HAMMOND COMPANY
CLEVELAND 13, OHIO
MANUFACTURED BY
MAC-IT PARTS COMPANY LANCASTER, PA.

SCREW TOP OILERS
for Vapor-Tight Protection



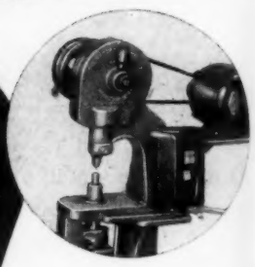
- **Covers Anchored—can't drop or lose.**
- **Tops gasketed for vapor-tight closure.**
- **Threads are die cut for snug fit.**
- **Knurled tops for convenient removal.**

Styles "RS", "AS", "ASA" and "STG" Oilers, although standard stock items, are somewhat of a specialty. They are particularly adapted for revolving, mixing or agitating equipment —in food processing and similar applications requiring rigid sanitation—also for chemical and other industries having harmful vapors or excessive dust conditions. Available in a range of capacities. Ask for catalog No. 60 presenting complete line of lubricating devices.

GITS BROS. MFG. CO.
1857 South Kilbourn Avenue, Chicago 23, Illinois
Exclusive for over 35 years

Versatile TOWNSEND RIVETERS

fasten ALL KINDS of RIVETS



For fastening solid rivets, hollow rivets, special studs, pins or links, regardless of the head contour desired, the Townsend Riveter is a "natural". In addition, the range of sizes handled is greater than that of any other competing machine.

Write for Our Monthly Bulletin on Riveting Machine Applications

THE H. P. TOWNSEND MFG. CO.
TOWNSEND
2 Chestnut St., Hartford 1, Conn.
Manufacturers of Automatic Screw Machines For all Secondary Operations

Bushey & Sons · MacDougall & Co.

Both use SMITHway *Certified* Electrodes

A Bushey-built U.S. Navy tug

Ira S. Bushey & Sons, Inc., of Brooklyn, N.Y., are famous builders of tugboats, including many tugs designed for U.S. Navy service. One of the country's large users of SMITHway *Certified* Electrodes, Ira S. Bushey & Sons know that the proof of SMITHway Electrodes is in shipyard production—and in service.

Welding in the MacDougall shop

MacDougall & Co., of Westmont, N. J., manufacturer of custom-built bodies, use SMITHway *Certified* Electrodes (SW 15) and SMITHway A.C. Welders. They know the superiority of SMITHway weldrods for all kinds of jobs in all kinds of shops—for light work no less than for the "big stuff."

SMITHway *Certified* Welding Electrodes—Made *by* Welders . . . *for* Welders

Through Leading Distributors Everywhere

SMITHway A.C. WELDERS

Six models, including three models of 150-, 200-, and 250-ampere capacity. Heavy-duty welders of 300-, 400-, and 500-ampere capacity. Write for specifications and prices.

A. O. SMITH Corporation

NEW YORK 17 • PHILADELPHIA 5 • PITTSBURGH 19 • CLEVELAND 4 • ATLANTA 3
CHICAGO 4 • TULSA 3 • MIDLAND 5 • DALLAS 1 • HOUSTON 2 • NEW ORLEANS 18
SEATTLE 1 • SAN FRANCISCO 4 • LOS ANGELES 14
INTERNATIONAL DIVISION: MILWAUKEE 1

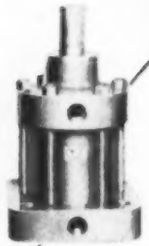
GEAR YOUR PLANT TO *Produce More*

...AT LOWER COST!

SPECIFY

T-J

for Tough Jobs!



T-J HYDRAULIC CYLINDERS

T-J AIR CYLINDERS

T-J CLINCHORS

T-J CUTTERS

T-J AIR CONTROLS

T-J RIVITORS

T-J Performance is helping plants throughout industry handle tough jobs at *top-speed* and *efficiency* . . . with *lower costs!*

Right now in your plant—there may be many jobs that T-J Products can perform faster and better. Check your needs for air cylinders . . . hydraulic cylinders . . . Rivitors . . . cutters . . . Clinchors . . . or air controls—these are products that T-J builds with ahead-of-the-times features! Backed by more than a quarter of a century's experience . . . T-J engineered and precision-built for utmost *accuracy* and *dependability.* Write for bulletins. The Tomkins-Johnson Co., Jackson, Mich.

TOMKINS-JOHNSON

RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

T-J

for improved Blanking, Stamping, Forming use

OAKITE STAMPING AND CUTTING PASTE

Oakite Stamping and Cutting Paste, water-soluble and non-pigmented, is used on a wide variety of forming, blanking, stamping or drawing operations. Mixed with water, it makes a stable, milky emulsion which may be as thin as a broaching solution (in drawing aluminum, for example); or of heavier consistency when emulsion is used in stamping heavy-gauge steel. It may be applied by swabbing with a brush; feeding through a drip cup; or by spraying on the work.

HERE'S WHY: Superior Lubrication • Money-Saving, Easy Removal • Longer Die Life • Fewer Rejects • Better Finishes •

CUTS YOUR CLEANING COSTS! In many shops Oakite Stamping and Cutting Paste supercedes pigmented compounds, mineral or lard oils because it is easy to remove. Only a hose flush with hot water is required to remove the compound in many instances. When used in stamping or forming of work that is to be soldered, welded, Bonderized or painted, Oakite Stamping and Cutting Paste makes important savings in cleaning costs.

SAVES METAL . . . SAVES DIES! The tendency toward burned or torn metal is minimized when work and dies are lubricated with this Oakite emulsion. A strong, protective film is developed, which does not break down under contact pressure. In drop-hammer forming, for example, this solution does not pick up metal shavings that scratch work surfaces and dies. In stamping both aluminum and steel, it improves die performance, reduces replacement and reworking of dies.

Also May be Used as an Additive in Machining Coolants Used with soluble-oil emulsions, Oakite Stamping and Cutting Paste enhances the lubricating properties of cutting fluids, thus provides better finishes. It wets the work and adheres, insuring improved cooling and less burning. Tools work longer without regrinding.

Ask for this FREE Advisory Service in your plant!

If you are shaping, stretching, bending or cutting aluminum, steel or brass, it will pay you to talk over cooling-lubricating problems with your local Oakite Technicial Service Representative. His broad metal-working experience can be most helpful to you in speeding operations and lowering costs. Why not arrange TODAY for his free service in your plant. Or write on letterhead for detailed data on any coolant-lubricant problems. No cost, no obligation.

Technical Representatives in Principal Cities of U. S. & Canada

OAKITE PRODUCTS, INC.
24 Thames St., NEW YORK 6, N. Y

OAKITE
REG. U. S. PAT. OFF.

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

FREE
-TO GEAR BUYERS

FREE THIS HANDY GEAR TOOTH CALCULATOR

The numbers on the outer edge of this device represent the diametral pitch of the gear. By turning the cut-out section to the desired number, the figures appearing in the space show circular pitch, circular thickness, addendum and the whole depth. ● These calculators are available to gear buyers upon request—with our compliments.

YOU FURNISH THE SPECIFICATIONS • WE'LL PRODUCE THE GEARS

PERKINS Precision, Custom-Cut GEARS

PERKINS MACHINE & GEAR CO., Springfield 2, Mass.

Now—the ABC's of DESIGNING MILLING FIXTURES, DRILL JIGS, AND TOOL LAYOUTS FOR TURRET LATHES

If you aim to be upgraded to a tool designer's job, here is just the manual to help you get started. In simple, easy-to-understand language, the book introduces you to the important practices in tool engineering work. It clearly explains principles and techniques you need to know to design simple drill jigs and milling machine fixtures, and to tool up for turret lathe work. Many diagrams and illustrations, plus valuable tables of design data, are also included to give you helpful and practical guidance in planning general-purpose and special-purpose machine tools.

Just Out

PRINCIPLES OF TOOL ENGINEERING

By RAYMOND R. BLOOM, Assistant Professor of Industrial Engineering, School of Engineering, The Pennsylvania State College. 234 pages, 5½ x 8½, 33 tables, 128 illustrations.

ONLY $2.40

PROVIDING you with a quick background picture of tool engineering, this manual briefly describes present-day production methods—comparing the making system with the manufacturing system. It explains interchangeability and dimensioning as they pertain to tool design and the tool engineer's training, duties and place in the manufacturing organization. It gives important information on the relationship of component parts as it affects tooling.

Details are supplied on design considerations for the various types of

- **machine tools**
- **milling machine fixtures**
- **drill jigs and bushings**
- **locating and clamping methods**
- **tooling for horizontal turret lathes**

Valuable data are presented to aid you in selecting the proper kinds of materials for a particular purpose, covering both structural and tool materials. To help you make best use of welding in tool design, the book explains and illustrates the welding symbols in use today and tells how you can apply them.

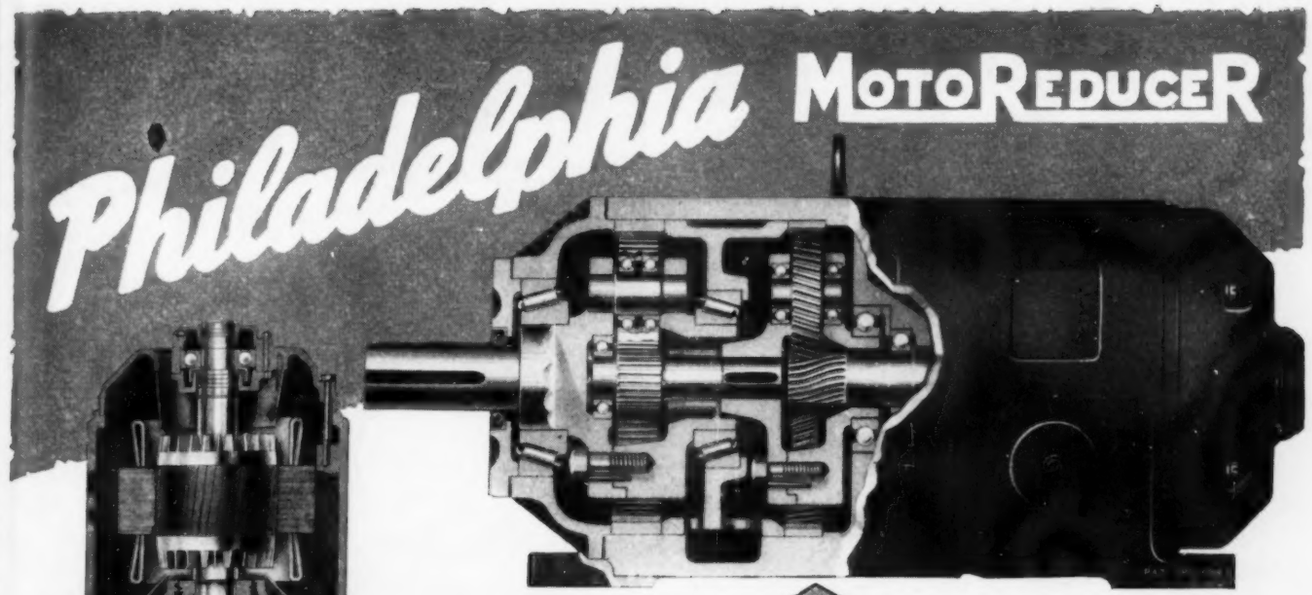
SEE IT 10 DAYS FREE—MAIL COUPON

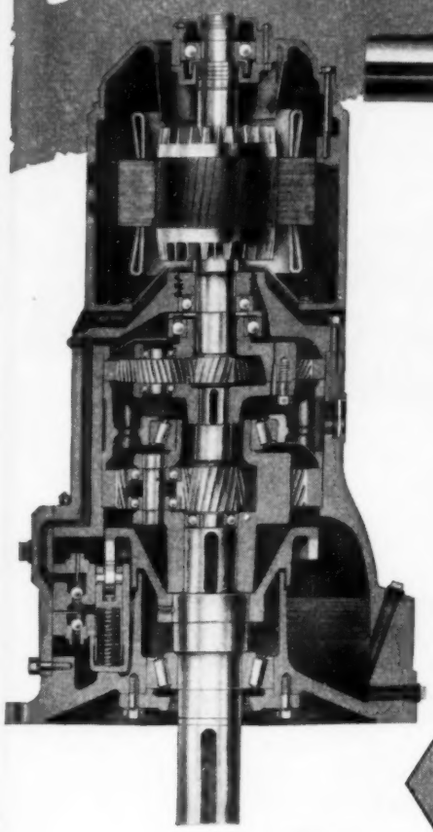
McGraw-Hill Book Co., 330 W. 42nd St., N. Y. 18
Send me Bloom—Principles of Tool Engineering for 10 days' examination on approval. In 10 days I will send $2.40 plus few cents postage or return book postpaid. (Postage paid on cash orders.)

Name .....
Address .....
City and State .....
Company .....
Position ..... A. 1-16-47

For Canadian price, write: Embassy Book Co. 12 Richmond St. E., Toronto 1.

Philadelphia MotoReducer





HORIZONTAL

VERTICAL

A "Self-contained" Drive FOR EVERY PURPOSE

The **MotoReduceR** is truly an "exclusive" Phillie Gear product, and its design and construction is based upon nearly 55 years' gear making and speed reducer experience.

These Units are available in both Horizontal and Vertical Types, and form the "ideal combination" of a high-grade motor and a Planetary Speed Reducer—a balanced, neat-looking unit that operates with minimum vibration and requires little or no attention. Another feature is, that every part is easily accessible; i.e., either the motor or reduction gears may be removed without disturbing the others—and these units are easily bolted in place, even in the most out of the way places.

Send for our 52 page Catalog, using your business letterhead, please.

Philadelphia GEAR WORKS INCORPORATED

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO . . . IN CANADA: WILLIAM AND J. G. GREEY LIMITED, TORONTO

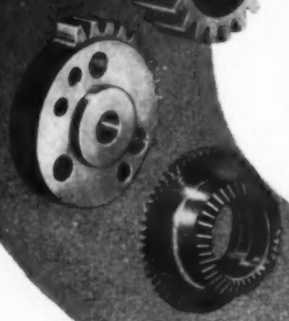
Industrial Gears and Speed Reducers
LimiTorque Valve Controls

SIER-BATH

extends

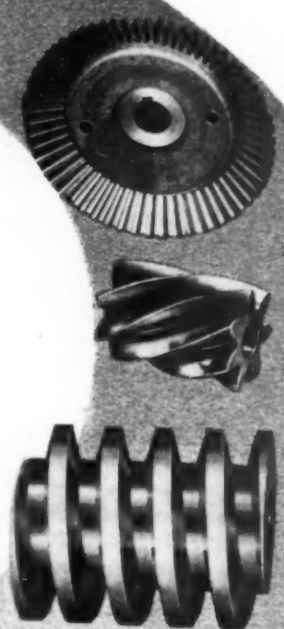
ITS RANGE OF GEAR-MAKING FACILITIES

SIER-BATH is now prepared to grind involute and straight side splines on shafts up to 42″ between centers. We also grind teeth in spur gears up to 16″ diameter and spirals up to 10″ diameter. Where there is a great degree of hardness, and accuracy of spacing involute form is required, we accomplish this by grinding methods on latest types of equipment. Where the same degree of accuracy is essential on softer materials, we obtain the best results by the shaving process.



GEAR RANGE

● With the increase in our facilities mentioned above, Sier-Bath now handles the following range of work: spur, helical and worm gears to 48″ diameter 3 D.P. and finer; straight tooth bevel gears 32 pitch to 3 pitch up to 23″ P.D. depending on ratio. Gears shaved from 1″ to 24″ Continuous herringbone gears generated by Sykes method up to 37″ O.D. Worms and threads precision ground on J. & L. Thread Grinder to extremely close tolerances. Spur gear grinding up to 16″ diameter, helical gear grinding up to 10″ diameter. Involute and straight side splines ground up to 42″ between centers.



ALSO MAKERS OF SIER-BATH SCREW AND GEAREX ROTARY PUMPS

FOUNDED 1905 MEMBER A.G.M.A.

Sier-Bath GEAR and PUMP CO., Inc.

9246 HUDSON BOULEVARD NORTH BERGEN, NEW JERSEY

USE THE MONEY-MAKING SPEED OF AIR EXPRESS

When sales are endangered because of production difficulties, get materials, replacement parts, tools, dies, and needed machinery the *fastest* way! Specify Air Express!

No supplier or wholesaler is more than a matter of hours away when you specify Air Express delivery. And the costs are surprisingly low — drastically reduced from prewar rates. Let Air Express solve your shipping problem — how to get it or deliver it quickly! Use this high-speed service to keep production flowing — and profits up!

Specify Air Express-a Good Business Buy

Shipments go everywhere at the speed of flight between principal U. S. towns and cities, with cost including special pick-up and delivery. Same-day delivery between many airport towns and cities. Fastest air-rail service to and from 23,000 off-airline communities in the United States. Service direct by air to and from scores of foreign countries in the world's best planes, giving the world's best service.

RATES CUT 22% SINCE 1943 (U. S. A.)

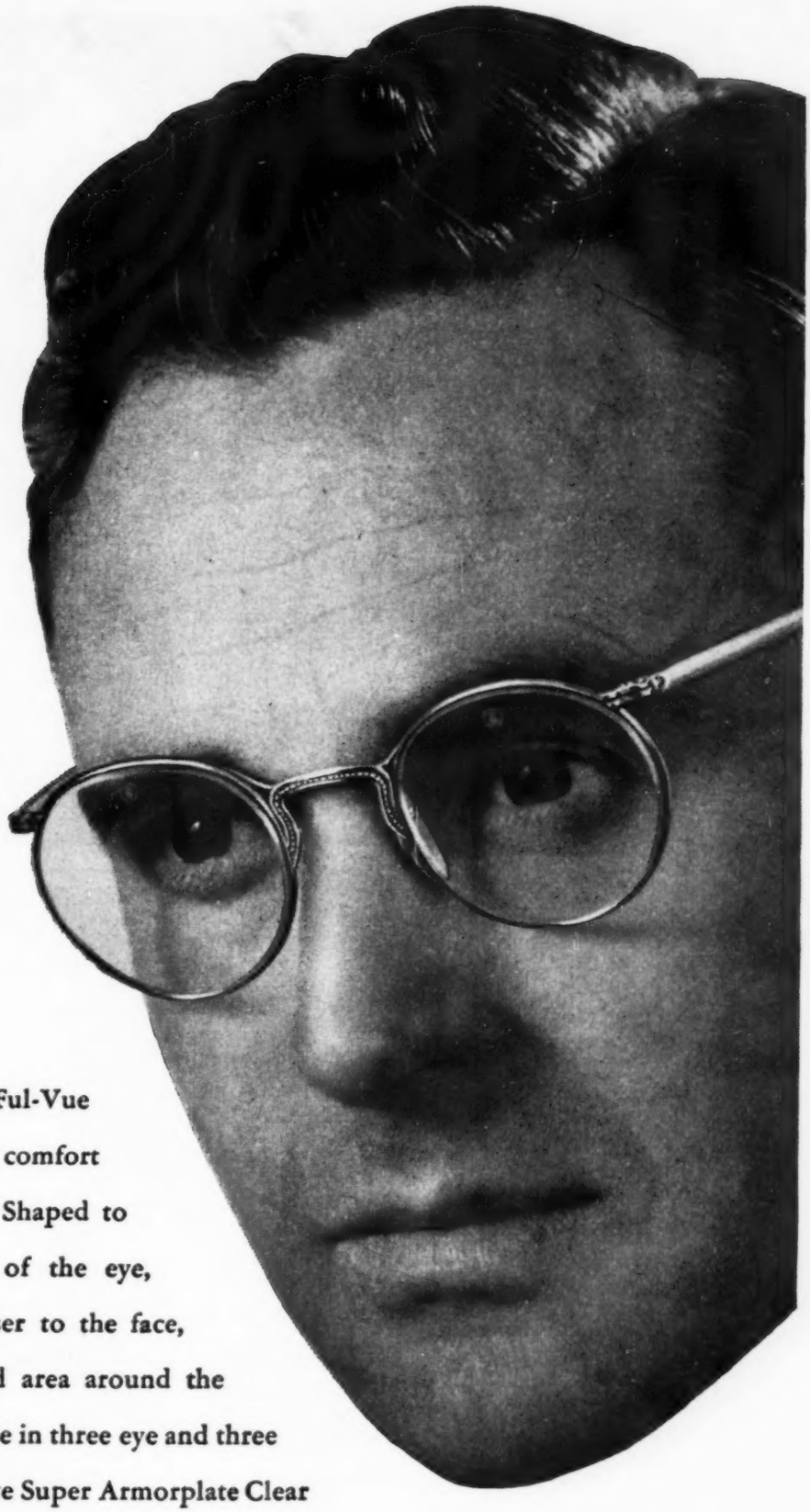
AIR MILES	2 lbs.	5 lbs.	25 lbs.	40 lbs.	Over 40 lbs. Cents per lb.
149	$1.00	$1.00	$1.00	$1.23	3.07c
349	1.02	1.18	2.30	3.68	9.21c
549	1.07	1.42	3.84	6.14	15.35c
1049	1.17	1.98	7.68	12.28	30.70c
2349	1.45	3.53	17.65	28.24	70.61c
Over 2350	1.47	3.68	18.42	29.47	73.68c

INTERNATIONAL RATES ALSO REDUCED

AIR EXPRESS GETS THERE FIRST

Write Today for the Time and Rate Schedule on Air Express. It contains illuminating facts to help you solve many a shipping problem. Air Express Division, Railway Express Agency, 230 Park Ave., New York 17. Or ask for it at any Airline or Railway Express office.

Phone AIR EXPRESS DIVISION, RAILWAY EXPRESS AGENCY
Representing the AIRLINES of the United States



A-O Ful-Vue Safety Goggles for Good Looking Eye Protection

Workers like A-O Ful-Vue Safety Goggles for their comfort and good appearance. Shaped to conform to the orbit of the eye, lenses are brought closer to the face, leaving no unprotected area around the bridge of the nose. Made in three eye and three bridge sizes, with 6-curve Super Armorplate Clear or Calobar lenses—with or without side shields. The nearest A-O Safety Representative can supply you.

American Optical Company — *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS. OFFICES IN PRINCIPAL CITIES

30,000 STAMPINGS PER HOUR

Hi-SPEED PETERSON *Punch* PRESS

SPECIAL FEATURES • Centralized Lubrication. Micrometer Adjustment for Punch. All Steel Welded Frame. Absolute Safety Mechanism. Built-in starting Switch, N.E.M.A. Standard. Oilite Bearing and Bushings. Improved Standard Machinery Co., Clutch. Peterson High Speed Friction Feed. Ball bearing Connecting Arm. Veelos Adjustable V Belt. Required floor space, 20" x 23". Press available in ½" or 1" stroke. Adjustable speed, from 200 to 500 per minute.

WRITE US AT ONCE FOR DETAILED INFORMATION

Woolley Division **HAMMEL-DAHL CO.**

233 RICHMOND ST., PROVIDENCE 3, R. I.

GEAR NOISE FATIGUES

SAPS STRENGTH—LOWERS PRODUCTION INCREASES ACCIDENTS

Silent G-E nonmetallic gears eliminate fatiguing gear noise. Two types are available for a wide variety of applications.

G-E FABROIL GEARS for heavy-duty applications consist of compressed cotton fibers held together by steel shrouds and threaded studs.

G-E TEXTOLITE GEARS for lighter jobs consist of numerous layers of woven fabric held in compression by a phenolic resin.

BOTH ARE STRONG – SILENT – RESILIENT

For complete information contact your gear cutter. For the bulletin, "Silent Gears," write to Section Y-1, Plastics Divisions, Chemical Department, General Electric Company, One Plastics Avenue, Pittsfield, Mass.

GENERAL ELECTRIC

CD47-P7

MADE . . .
. . . to your requirements
You can save time and production delays by ordering spur, bevel, worm, spiral or herringbone gears from Earle. Earle cuts gears of all types to specification, in all practical materials and in diameters from inches up to 30 feet—gear racks, etc. You'll get better gear deliveries from Earle. Send us your prints.
THE EARLE GEAR & MACHINE CO.
4723 Stenton Avenue, Philadelphia 44, Pa.
Sales Offices: 149 Broadway, New York 6, N.Y.;
901 Davis Avenue, Pittsburgh 12, Pa.
EARLE GEARS

JUDGE A SPEED REDUCER BY EAR?

Your ears can tell you plenty about a speed reducer because there is no normal reason why a modern speed reducer should be noisy. Noise warns you that power transmission is not smooth . . . that wear-causing friction is present.

That's why the quiet operation of Farrel speed reducers is so important . . . so significant. The noise you *don't* hear provides the evidence of precision-generated, continuous tooth herringbone gears, transmitting power in a smooth, quiet, even flow.

The continuous tooth design means that a maximum number of teeth are always in mesh. Overlap or interlacing of teeth, together with gradual engagement, promote smooth operation. Oblique lines of contact and uniformly distributed load eliminate danger of noise resulting at some later date from uneven tooth wear.

FB-331

Farrel speed reducers are available in a wide range of sizes and capacities. Write for descriptive catalog No. 438.

FARREL-BIRMINGHAM COMPANY, Inc.
344 VULCAN ST., BUFFALO 7, N. Y.
Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Charlotte

Farrel-Birmingham

There's a sound reason why

It is common practice in thousands of plants to specify Cincinnati GEARS, GOOD GEARS ONLY. Their precision control, accuracy and performance guarantee assured dependability.

Each Cincinnati Gear is made to fit your particular specifications. It saves time and money and puts the right gear in the right place.

THE CINCINNATI GEAR COMPANY
"Gears... Good Gears Only"
Wooster Pike and Mariemont Ave. ★ Cincinnati 27, Ohio

GRANT GEARS

"69 YEARS" MANUFACTURING GEARS

Despite the continued growth of our gear business we are still in position to give each customer the attention they have a right to expect.
We carry a complete stock of standard cut gears and can furnish special gears to your specifications.

GRANT GEAR WORKS
BOSTON, MASS.
ESTABLISHED 1877 · BY GEO. B. GRANT

SPECIALISTS... not jacks of all trades!

To do one thing *perfectly* rather than many things well is the sole objective of every MEISEL gear. And being constructed with only the requirements of a specific job in mind, MEISEL gears function at maximum efficiency always. Whatever your gear problem, investigate the advantages of *specifically* engineered gears by MEISEL.

MEISEL PRESS MFG. CO.
946 Dorchester Avenue Boston, Mass.

SEND US YOUR PRINTS FOR *Quotations*

GEAR SPECIALISTS — BROACHING
THREAD GRINDING

TAYLOR MACHINE Co.
1917 EAST 61ST ST. ★ CLEVELAND 3, Ohio

BAUMBACH *The* DIE SET AUTHORITY

All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

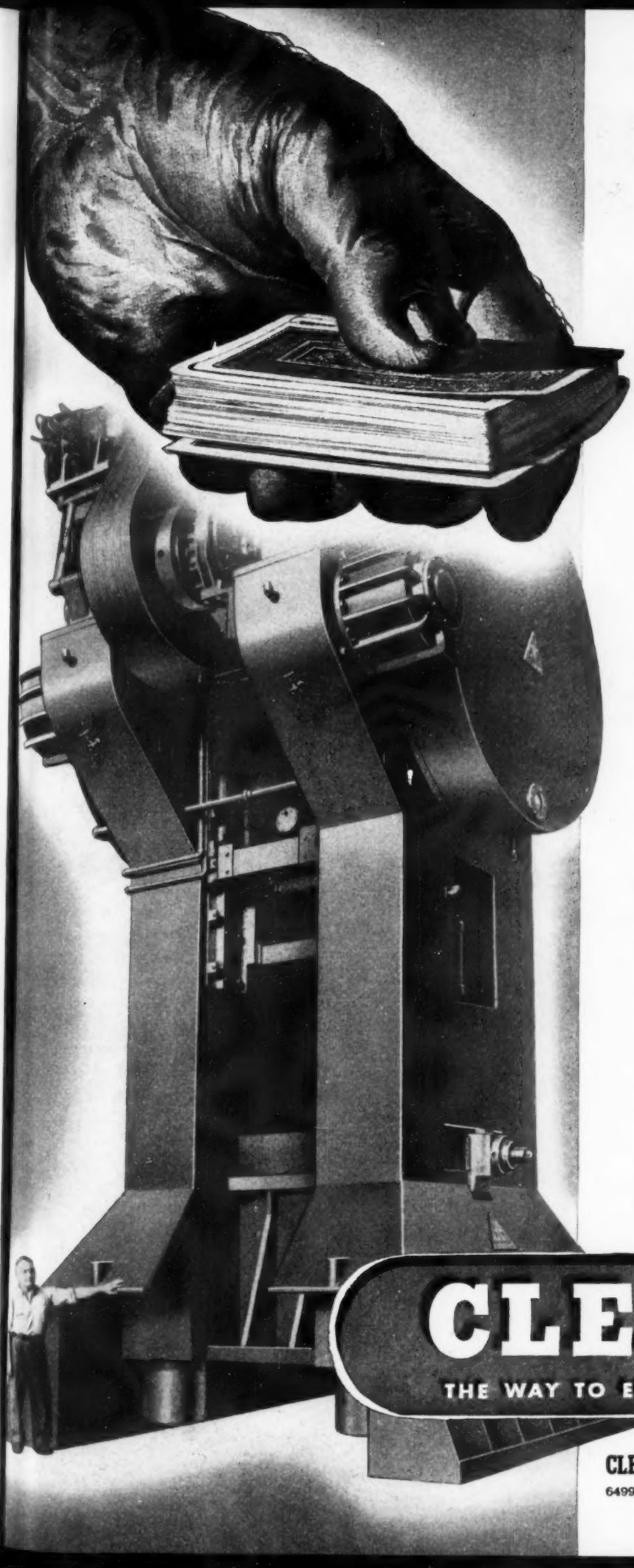
E. A. BAUMBACH MFG. CO., 1804 S. Kilbourn Ave., Chicago 23, Ill.

GANSCHOW

CUT GEARS (MEMBER OF AGMA) ALL TYPES

Better Gear Products

GANSCHOW GEAR CO., 14 N. Morgan Street, CHICAGO 7.



Revelation of a Production Ace

Magicians manipulating cards seldom succeed with heavy, muscular hands. Traditionally, such manual dexterity is associated with adroit, supple fingers, not piano-moving strength.

In a production machine, too, the combination of strength and dexterity is rarely expected, yet Clearing has long built press equipment of exactly that combination—tremendous strength and remarkable precision. The same press that exerts the pressure of a giant will deliver parts to amazingly close tolerances.

This unique combination in the Clearing press opens up whole new vistas of operating economies. Everybody knows that a *press* delivers parts faster and at lower cost than any other available means of production. This, coupled with the Clearing ability to stamp out sizable parts with extreme precision, may give you just the winning cards you need in a battle against rising manufacturing costs. Here is a production ace whose potentialities shouldn't be overlooked.

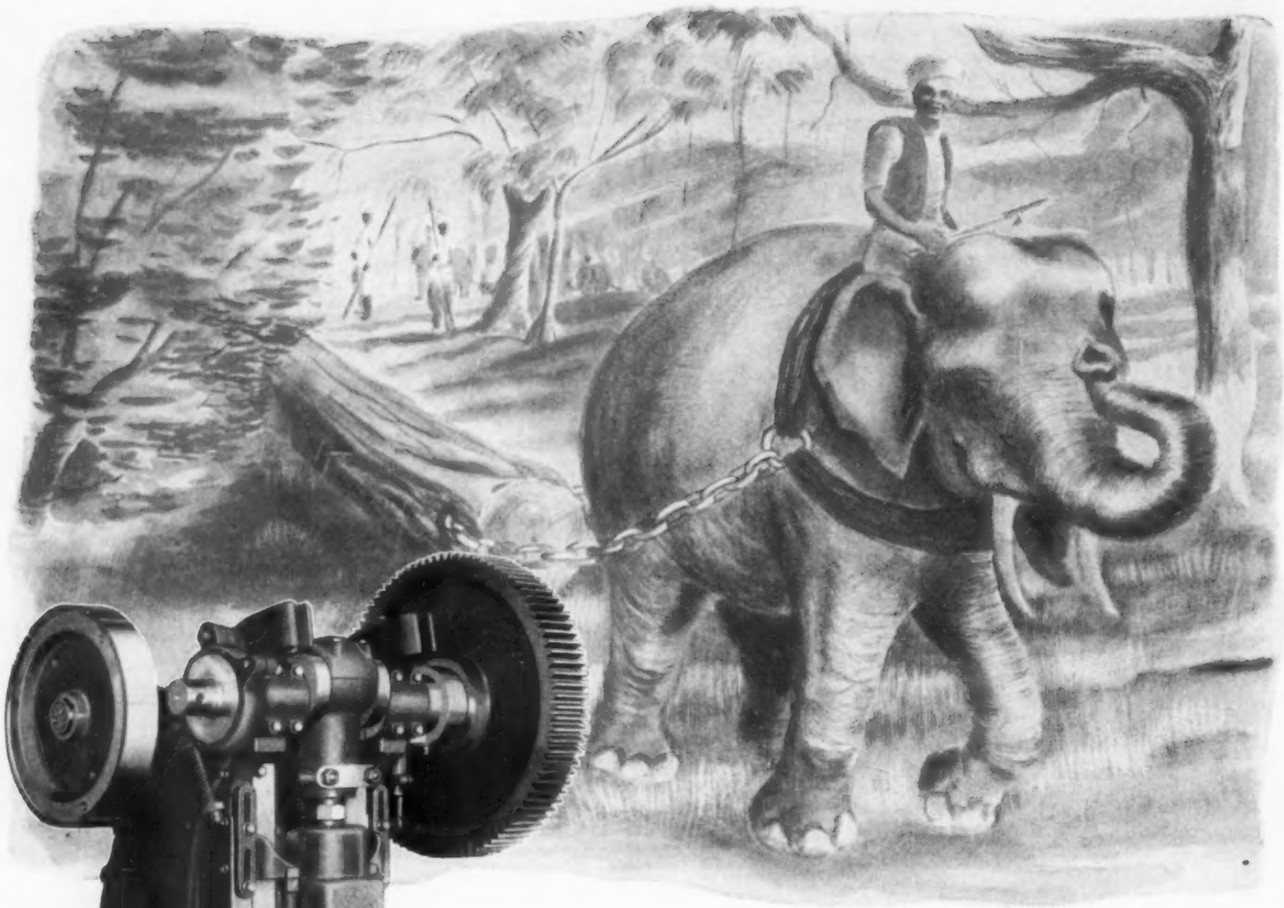
If you can see the possibility of utilizing the speed, the precision, the strength and the low unit cost of a Clearing press at some new point in your production line, don't hesitate to consult with us. At Clearing you'll find full cooperation and expert advice in what a press can do for you.

CLEARING

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS



BETTER PERFORMANCE ON THE TOUGHEST JOBS

Put your toughest job on a Federal Press and watch the performance curve shoot upward! For Federals have the reputation of increasing production on almost any job. Furthermore, Federals not only handle with ease the secondary operations common to ordinary presses, but primary and assemb'y work as well — in some cases perform intricate combinations of all three! Burnishing, broaching, forming, staking, and high speed marking are handled with ease. Production goes up — costs come down. Equally important, Federal Presses are ruggedly built to stand up under hardest usage and give years of continuous service. Write today for latest catalog of complete Federal line.

THE FEDERAL PRESS CO.

147 Division Street, Elkhart, Ind. — Telephone 2831

FEATURES

Front Operated Recline • Timken Roller Bearing Flywheels • Frame - Anchored Knockout Bracket • Symmetrical Rams • Longer "V" Ways and Gibs • Oversize Crankshafts • Non-Repeat Clutch Mechanism • Safety Latch Spring

FEDERAL
OPEN-BACK — INCLINABLE
PRESSES

AVAILABLE IN 8 SIZES — CAPACITY, 6 TO 80 TONS

Because Federal Presses are in such great demand today, delay in shipment is unavoidable. But remember — Federals are worth waiting for!

Now-a new die steel

FOR DIE CASTING WHITE METAL ALLOYS
AND FOR PLASTIC MOLDS

free machining

EVEN AT 275-300 BRINELL

Speed-Cut

FIRST IN QUALITY
FIRST IN PERFORMANCE

Speed-Cut machines as readily at 275-300 Brinell as ordinary die steels that have been fully annealed. Furnished in the heat treated condition, Speed-Cut saves you money by eliminating treating and polishing costs. Also available annealed.

Get all the facts about this new steel. Write for descriptive bulletin just off press!

Vanadium-Alloys Steel Company
LATROBE, PA.
COLONIAL STEEL DIVISION—ANCHOR DRAWN STEEL COMPANY

GO AHEAD-

we'll take care of the baby!

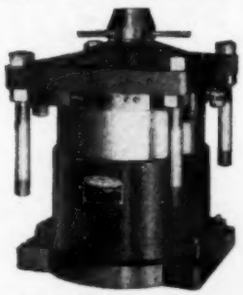
This old lap of ours was just made for you to drop your tooling problem in. We've been at it for years. Try us on yours, and get that machine tool trouble off your hands.

JIGS • FIXTURES • SPECIAL TOOLS
BUILDING COMPLETE MACHINE TOOLS
UNITS FOR MACHINE TOOLS
PUNCHES AND DIES

COLUMBUS DIE·TOOL and Machine Co.
940 CLEVELAND AVE.,
COLUMBUS 1 OHIO
ESTABLISHED 1906

+ **INCREASED PRODUCTION**
— **REDUCED SETUP TIME**
= **DAYTON ROGERS DIE CUSHIONS**

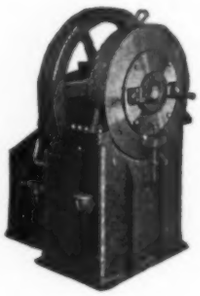
No matter how you figure it Dayton Rogers Die Cushions will assure better results and lower production costs on your punch press operations because:



1. They are readily adapted to either short run quantity requirements or for large quantity production.
2. They automatically convert a press from single action to double action for deep drawing work.
3. Correct pressure pad control on forming dies obtained quickly by simply adjusting the pressure regulator.
4. They afford positive stripping action on all compound, blanking and piercing dies.

Write for illustrated, engineering catalog #100-1

DAYTON ROGERS
Manufacturing Company
MINNEAPOLIS 7, MINN.



THE
TORRINGTON
ROTARY
SWAGING MACHINE

— with 4000 forceful squeezing hammer blows per minute—makes metal tougher and more elastic. Send for booklet—"The Torrington Swaging Machine."

The Torrington Co., Swager Dept.
56 Field Street Torrington, Conn.

GRANT

RIVETERS — PIONEERS in their line—head rivets from smallest to 5/8" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.
85 Silliman Ave., Bridgeport, Conn., U. S. A.

300 TWIN BENDS per hour!

With Two DI-ACRO BENDERS

A difficult production problem of forming two bends in a long length of tubing was solved by "teaming up" two DI-ACRO Benders as illustrated. This dual-forming arrangement saved installation of special machinery. Two accurately formed bends are obtained in one operation—without distortion of the tube and at a cost competitive to power operated equipment. More than 300 pieces are completed per hour —600 individual bends.

"DIE-LESS DUPLICATING" Often Does it Quicker WITHOUT DIES

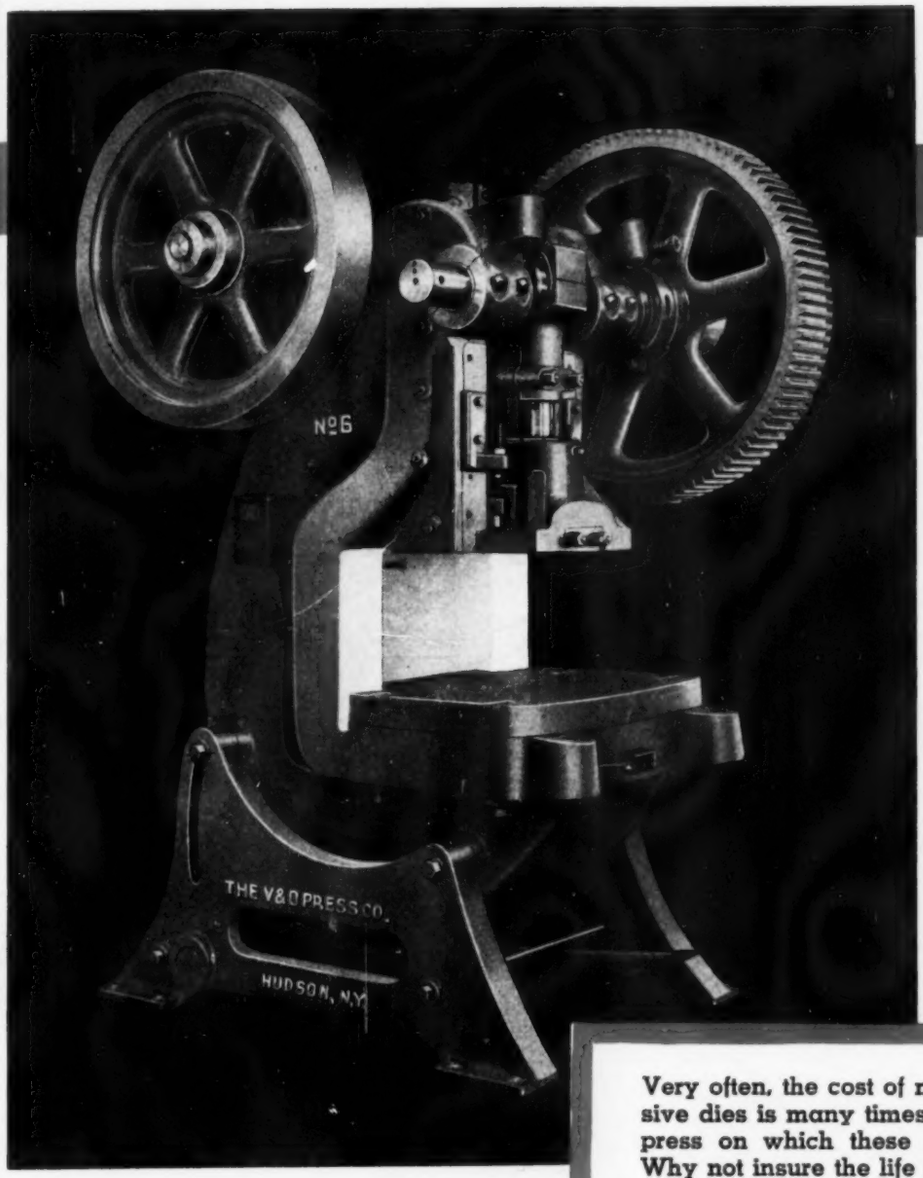
This is but one example of how DI-ACRO precision machines—Benders, Brakes and Shears—can accurately and economically duplicate a great variety of parts, pieces and shapes, without die expense. **Write for Catalog—"DIE-LESS DUPLICATING"**

◀ DI-ACRO is pronounced "DIE-ACK-RO".

DI-ACRO PRECISION MACHINES DIE-LESS DUPLICATING

O'NEIL-IRWIN MFG. CO.
311 EIGHTH AVENUE • LAKE CITY, MINNESOTA

Outstanding V&O Features



Very often, the cost of modern progres sive dies is many times the cost of the press on which these dies are used. Why not insure the life of your dies by using precision press equipment in your press room? We earnestly solicit that you investigate the rigidity, accuracy, and many outstanding features of the V & O Press.

THE V&O PRESS COMPANY

INCORPORATED

DIVISION OF ROCKWELL MANUFACTURING CO.

Hudson, New York

for FINEST DIE SETS PLUS FAST SERVICE

call PRODUCTO

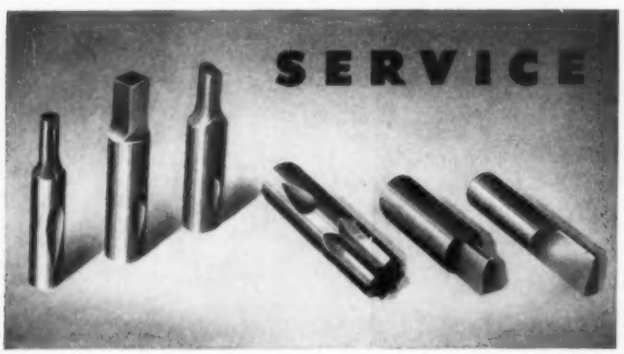
You will never have to worry about the quality of your die sets once you place responsibility in the hands of skilled Producto experts. What is more, you'll regularly get faster and more efficient service from our SIX conveniently located assembly and service headquarters. Write for our catalog No. 9, if you do not have one in your file.

THE PRODUCTO MACHINE CO.
990 Housatonic Ave., Bridgeport 1, Conn.
Bridgeport 4-9481

PRODUCTO SERVICE IS ALWAYS AT THE PHONE ON YOUR DESK . . . . .

Call

NEW YORK 12,	CLEVELAND 14,	DETROIT 11,	INDIANAPOLIS 2,	LOS ANGELES 21,
197 Lafayette St.	5345 St. Clair Ave.	3017 Medbury	635 Fulton St.	2168 E. Olympic Blvd.
Worth 4-7484	Express 1133	Plaza 3101	Lincoln 5385	Trinity 9827



WITH A *Punch!*

Allied's R-B Interchangeable Punches and Dies for the metal-working and plastics industries are *available from stock* in standard round, oblong and square shapes of almost any required size. Special shapes such as those illustrated are *promptly furnished* to your specifications in any size or material.

Full information and comprehensive R-B Catalog on request.

ALLIED PRODUCTS CORPORATION
Department 21 • 4612 Lawton Ave.
Detroit 8, Michigan

BETTER ASSEMBLY

FORMING • EMBOSSING
RIVETING • HEAT-SEALING
CRIMPING • BROACHING
MARKING • STAKING • ETC.

AIR-HYDRAULIC PRESS

SIZES: 2½ TON AND 6 TON CAPACITIES

DOES MORE JOBS—Countless operations in metals, plastics, ceramics, leathers, etc. Delivers delicate pressures for the lightest jobs, or up to 2½ or 6 tons pressure . . . for work now being done on presses many times the size.

SIMPLE OPERATION — Quick action hand or foot operated valve or solenoid valve with push-button control requires no physical effort. No noise, no impact shock, no operator fatigue.

CONTROLLED AIR PRESSURES—Just tap into your present air line. Delivers ram pressure 50 and 120 times air intake pressure on 2½ and 6 ton models respectively. Adjustable, predetermined pressure delivered entire length of stroke —regardless of thickness variations of work.

SIMPLE CONSTRUCTION — All working parts contained within housing. No cams, levers, pins, gears in power mechanism. No intricate assemblies to get out of order, fewer parts liable to wear than any other press in the field.

Write for Catalog

AIR-HYDRAULICS, INC.
Factory: 120 West Middle Street, Chelsea, Mich.
Sales Office: 401A Broadway, New York 13

YOUR PRESSES *CAN* DO MORE FOR YOU!

It's a simple matter to get (1) SAFER operation, (2) more operator satisfaction and (3) more production from your presses. Just install Schrader Press Controls. Let them put compressed air to work for you—efficiently! Eliminate fatiguing leg movements, keep hands automatically away from danger zone. Thousands of Schrader Press Control Sets are in use in leading plants.

Contact your mill supply distributor or write for Catalog 3 containing details on the various types of Schrader Controls for presses. You'll save money in many ways!

1844 1947

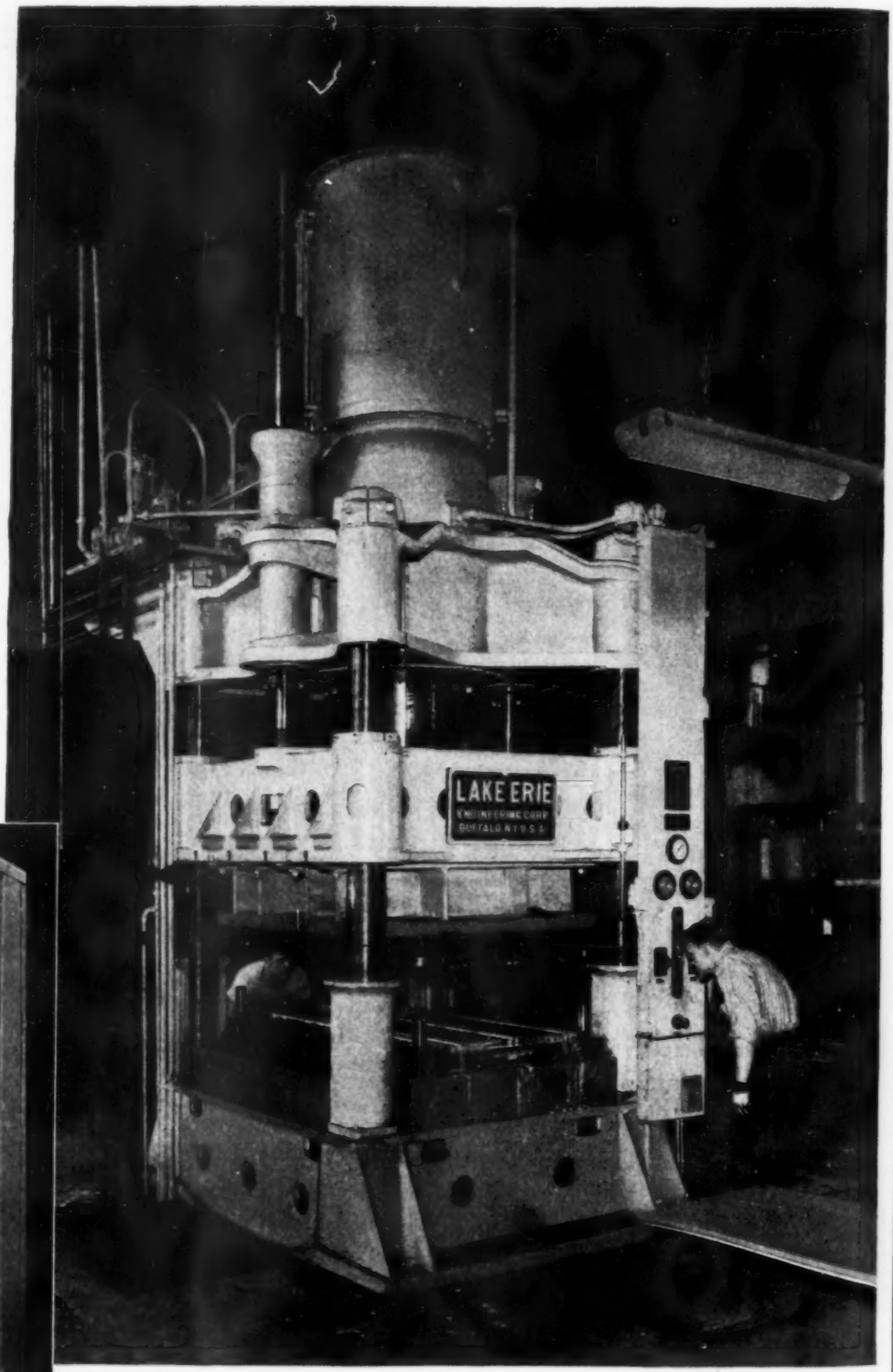
PRESS CONTROLS

OTHER SCHRADER PRODUCTS FOR EFFICIENT AIR CONTROL
Air Valves 2,3,4-way • Air Operated Machine Controls
• Air Operated Press Controls • Quick Acting Couplers
• Blow Guns • Air Ejection Sets • Hydraulic Gauges

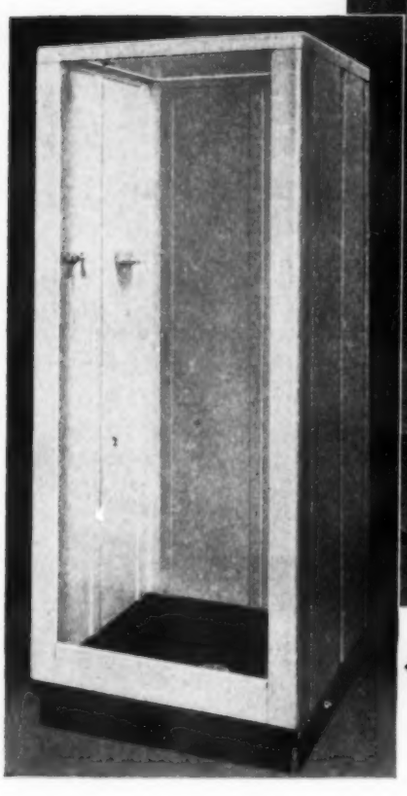
Schrader
PRODUCTS
CONTROL THE AIR

A. SCHRADER'S SON, *Division of Scovill Manufacturing Company, Incorporated,* BROOKLYN 17, N. Y.

LAKE ERIE Hydraulic Press

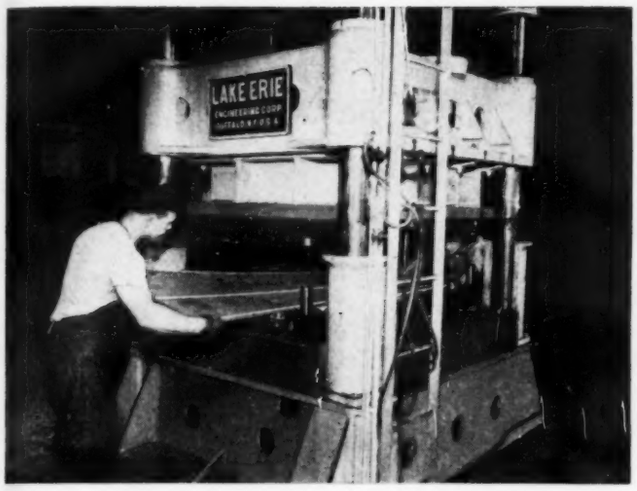


Six-hundred ton Lake Erie Hydraulic Press in operation in the plant of the Tiletone Company in Chicago. Press is column type, single action, self-contained unit. Lake Erie Hydraulic presses are available in a wide range of standard types and sizes to meet nearly all needs. Special presses are engineered to order when required.

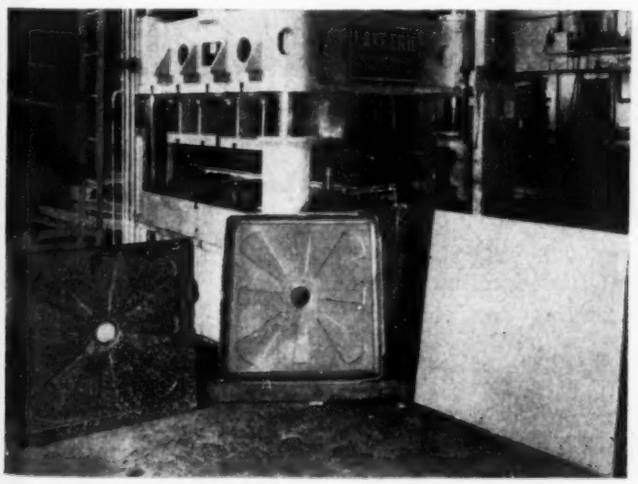


Complete assembly of the portable stall shower manufactured by the Tiletone Company. The Lake Erie Hydraulic Press makes it possible to produce a clean, attractive shower...stiffeners are eliminated...manufacturing operations are reduced...assembly is simplified...time, materials and money are saved.

lowers production costs for the Tiletone Company



Forming sides for the portable stall shower. Note the three rectangular sections formed-in the panel. This eliminates the need for small panels or angles that would otherwise be required to give the sides rigid construction. Result—material is saved, production is simplified and the cabinet has a clean, modern appearance.



The bottom section or receptor for a portable stall shower. Twenty-one operations were required in its production by the old method. Now it is made in six operations which include drawing, coining, trimming and punching holes for assembly and bottom drain. New method gives time saving of about 66⅔%.

The Tiletone Company of Chicago, manufacturers of portable stall showers and other products, report that their new Lake Erie Hydraulic Press is a mighty good investment. The press is not only saving time and money—but it simplifies production and makes it possible to turn out higher quality work. Among other things, hydraulic press production has eliminated the need for side stiffeners in the portable stall shower and has reduced manufacturing operations on the bottom section from twenty-one to six.

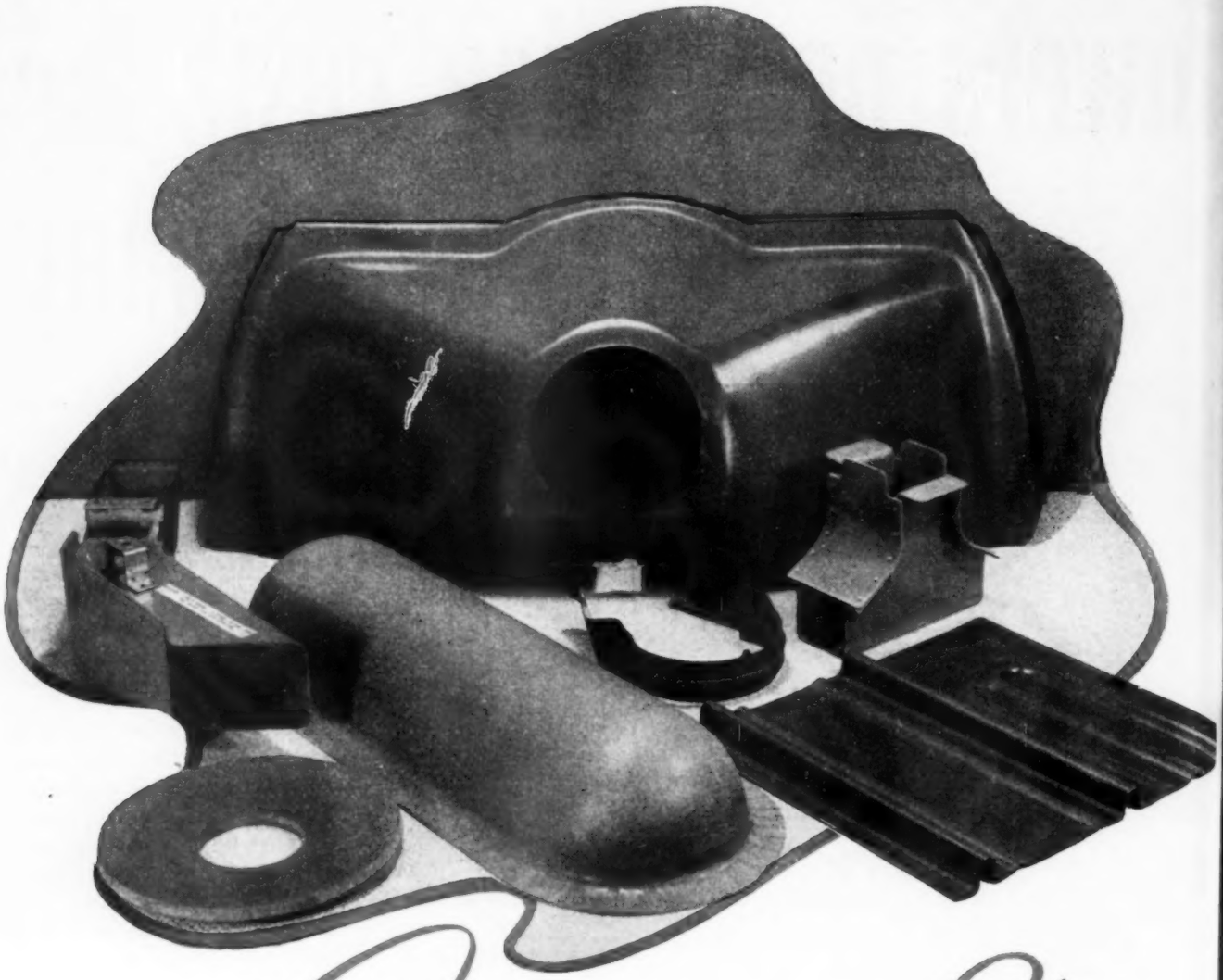
The high-speed, automatic and semi-automatic hydraulic presses now available are changing many manufacturing conceptions and methods. These hydraulic presses are introducing new, faster, better ways of producing many products. Lake Erie Engineers are specialists in applying hydraulic presses to today's production. They will be glad to cooperate with you in determining how you can use hydraulic presses to best advantage. Merely write to them about your production problems or requirements. No obligation, of course.

LAKE ERIE
ENGINEERING CORP.
BUFFALO, N.Y. U.S.A.

LAKE ERIE ENGINEERING CORP.
507 Woodward Ave., Buffalo 17, N. Y.

Offices in Principal Cities and Foreign Countries

● Leading manufacturer of hydraulic presses—all sizes and types—metal working... plastic molding... processing... rubber vulcanizing ... stereotyping... special purpose.



Complicated Shapes

ARE NOW EASILY MADE WITH **FORMICA!**

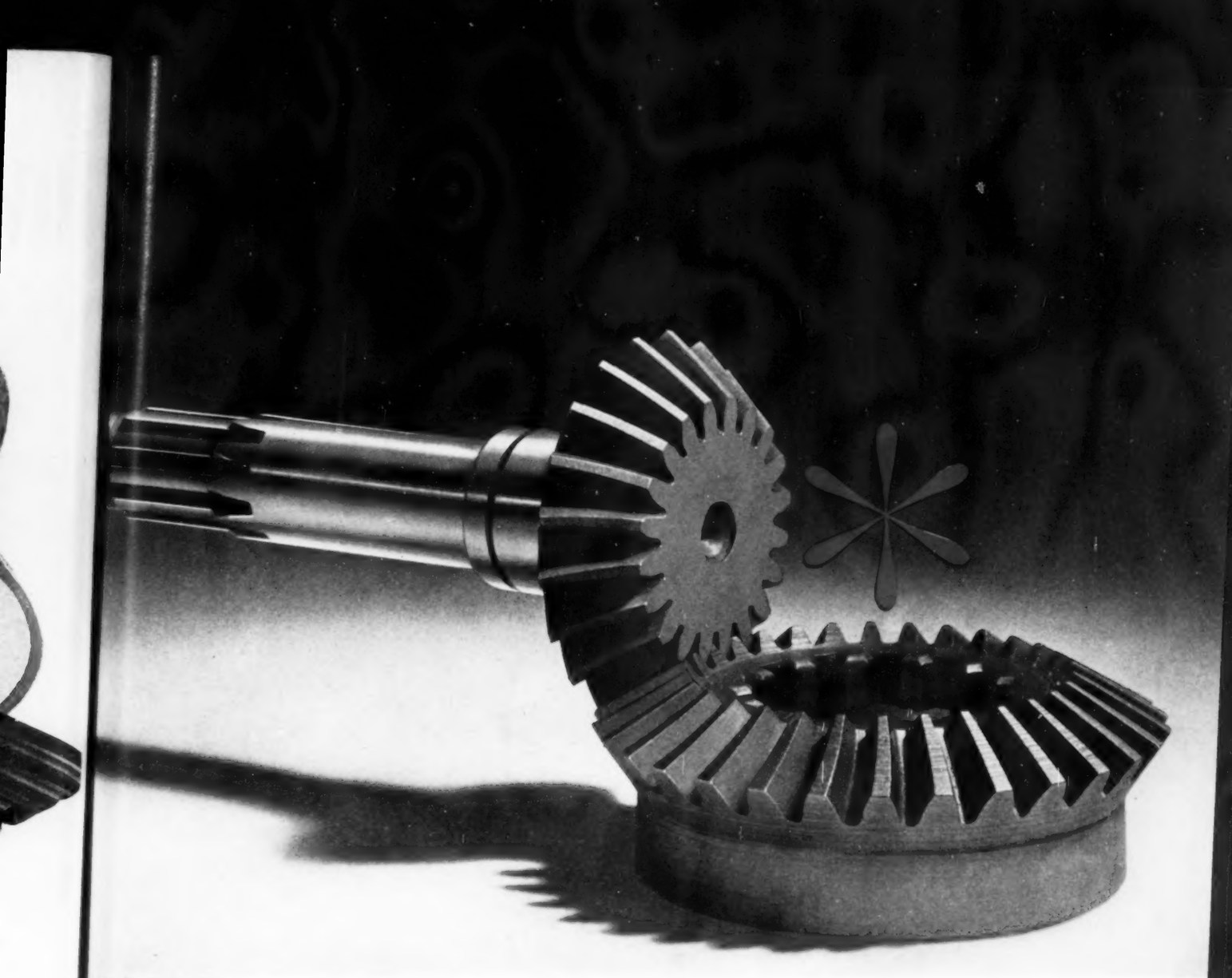
NEWLY developed post-forming techniques have made it possible to produce Formica economically in many new and useful shapes for all sorts of uses.

The method is simple. Sheets of a special grade of material are heated and placed in a press with wooden dies and stamped to the required shape. That shape is retained for the life of the material.

This has made the adaption of the material possible to many new uses. Perhaps it would serve better some purpose that you are now taking care of with metal.

FORMICA
TRADE MARK REG. U.S. PAT. OFF.

THE FORMICA INSULATION CO., 4662 SPRING GROVE AVE., CINCINNATI 32, OHIO



* Here's a tooth for an eye that's watching costs

IF YOU need gears that eliminate the end thrust characteristics of conventional spiral bevels—yet retain their smoothness, strength, and tooth bearing localization—the zerol bevel gears shown above may fit your picture. Notice the ends of each tooth are on a radial line, yet each tooth is curved, bringing the quiet operation and cost-saving advantages of two designs into one.

There's more to these gears than meets the eye, however. You cannot see, for instance, the men and machines that shape their future . . . the little details of manufacture no one of which can safely be slighted, if the integrity of our trade mark is to be upheld. The Double Diamond mark may not show in the final assembly—*but someone's trade mark does.* And if your trade mark depends in part on gear performance, we have a record of *specifications met or exceeded* that will interest you.

DOUBLE DIAMOND TRADE MARK GEARS

Made by

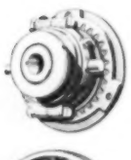
AUTOMOTIVE GEAR WORKS, INC.
RICHMOND, INDIANA

FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS

TRANSMISSIONEER...

WHO'S HE?

He's a graduate of a Dodge factory course, qualified by intensive training and a broad practical experience to give you the latest answers to problems in efficient mechanical transmission of power—in your plant or as applied to your product.

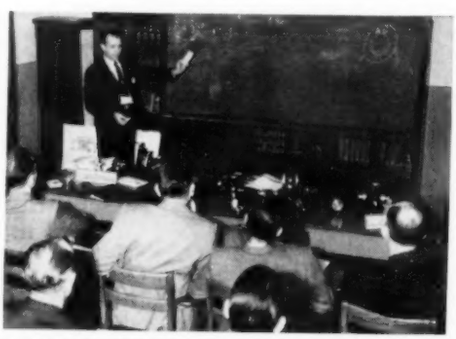


The Transmissioneer is backed by a broad line of Dodge bearings, sheaves, pulleys, clutches and other drive components. He is qualified by training and experience to select elements which make *the right drive for the job.*

Typical of the engineering advancement which marks Dodge products is the new Taperlock sheave, which has the simplest, surest mechanism ever devised for fastening wheels to shafts. For information about Taperlock—and other new developments in the mechanical transmission of power, call the Transmissioneer — your local Dodge distributor. Most power drive requirements can be supplied direct from the distributor's stock.

Look in the classified telephone directory under "Power Transmission Equipment" for your Transmissioneer's name and number. Call him for advice—without obligation.

DODGE MANUFACTURING CORPORATION, MISHAWAKA, INDIANA



To obtain his diploma every Transmissioneer must pass an intensive course of training at the Dodge factory. Lectures, classroom work and practical demonstrations of power transmission problems make up the course.

DODGE
MISHAWAKA

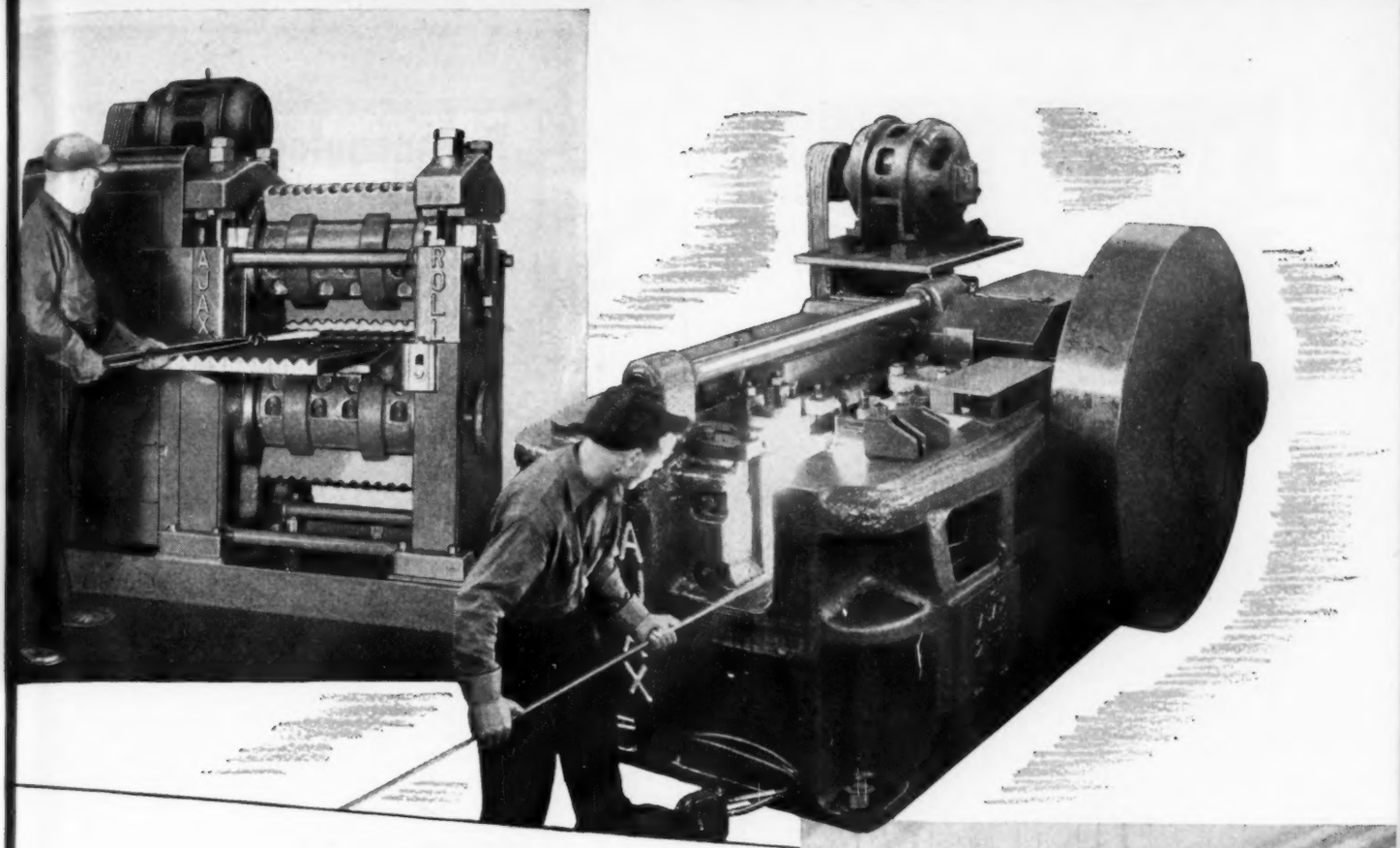
THE SYMBOL THAT CAME TO LIFE

257 factory graduate Transmissioneers wear this sign of a nation-wide personal service that helps you put all your power into the job.

Copyright, 1946, Dodge Mfg. Corp.

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

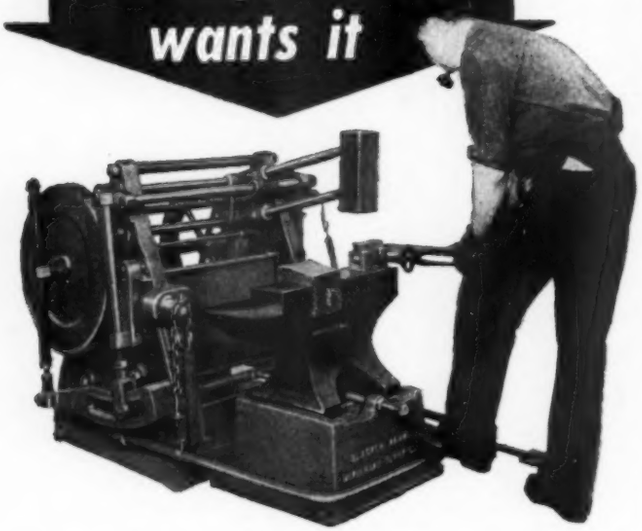


AJAX
FORGING MACHINERY
Affords the Utmost in Forging Production Advantages

The AJAX line of Forging Machinery is built on the basis of mechanical soundness and embodies many exclusive mechanical features which effect most valuable production advantages. In selecting modern forging equipment now, with an eye on the more competitive years ahead, such advantages as fast operation, less man power required, longer die life, greater accuracy and reduction in subsequent finishing operations are of vital importance. And when the cycle of business returns to that point where production efficiency is paramount, the manufacturer who is equipped with such machinery as this will be in a position to maintain a high output of quality forgings at a consistently low production cost. Write for descriptive bulletins.

THE AJAX MANUFACTURING COMPANY
EUCLID BRANCH P. O. CLEVELAND 17, OHIO
110 S. DEARBORN ST. CHICAGO 3, ILLINOIS
DEWART BUILDING NEW LONDON, CONN.

EVERY BLOW exactly as he wants it



No confusion, no misunderstandings, no wasted time for the smith using a Blacker Hammer.

Every blow is delivered where he wants it, when he wants it, as heavy or as light as he wants it.

Replacing hand sledges and helpers around the anvil, this direct-geared, electric-motor-driven power hammer gives the smith complete control throughout the entire forging operation.

A foot treadle regulates speed and force, leaving the smith's two hands free to manipulate work on the anvil. Result—greater speed, fewer reheats, greater output.

DESCRIPTIVE BULLETIN FREE

Shows how a McKiernan-Terry Blacker Hammer can save you time and money and increase shop capacity. Full information, diagrams, specifications. Every blacksmith shop needs this book. Send for your free copy.

McKiernan-Terry

BLACKER HAMMER

Sign and Send NOW

McKiernan-Terry Corp., Mfg. Engineers
18 Park Row, New York 7, N. Y.

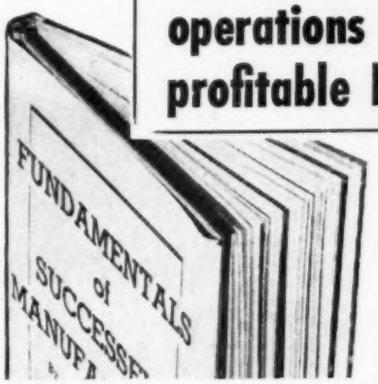
Please send me Blacker Hammer Bulletin 56

Name .....

Address .....

1-47

Put manufacturing operations on a more profitable basis—



—with these profit-making, efficiency-improving pointers

THESE days when manufacturing in every field must meet the stiff challenge of competition, you can't afford guess-work, haphazard organization. Today you want to make sure of peak output—of getting that new business off on the right foot, or of bringing the established concern in line with modern manufacturing management. Here are 16 chapters of just such fundamental manufacturing considerations, illustrated with actual case studies. Let this clear, new treatment of every important phase of modern manufacturing management help you plan the big steps that keep you in business, make the changes that give you a bigger profit doing it.

Just Published

Fundamentals of Successful Manufacturing

By GEORGE GAYNOR HYDE, Consulting Engineer.
McGraw-Hill Industrial Organization and Management Series. 201 pages, 5¾ x 8¾, 21 illustrations, $2.50

THIS book provides executives with a simple and basic yet complete analysis of the fundamentals of modern manufacturing, to guide them in establishing a new enterprise or in modernizing an existing one. Stressing the importance of good organization and developing an *objective* viewpoint of manufacturing problems, the book covers in detail such processes as designing and processing the product, housing the enterprise, personnel practices, management controls, etc., and supplies a new slant on such important subjects as designing, formalizing, evaluating, and staffing the organization. The Case History method of presentation is used throughout.

Read how to—

—determine best methods of marketing
—make a process chart
—increase efficiency if material must be moved in batches
—avoid bad design in including services on your building layout
—choose a good manufacturing location
—design the organization to correlate the various functions
—determine a fair rate of compensation for each function in the organization
—choose the best man for the job
—maintain good labor relations within the plant
—install planning and control procedures

Let these chapters help you

1. Determining the Policies
2. Designing the Product
3. Processing the Product
4. Selecting the Facilities
5. Making the Layout
6. Choosing the Location
7. Housing the Enterprise
8. Designing the Organization
9. Formalizing the Organization
10. Evaluating the Organization
11. Staffing the Organization
12. Personnel Practices
13. Planning Production
14. Management Controls
15. Research and Development
16. Conclusion

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., 330 W. 42nd St., N. Y. C. 18

Send me Hyde's Fundamentals of Successful Manufacturing for 10 days' examination on approval. In 10 days I will send $2.50 plus few cents postage, or return book postpaid. (Postage paid on cash orders. Same return privilege.)

Name .....

Address .....

City & State .....

Company .....

Position ..... A. 1-16-47

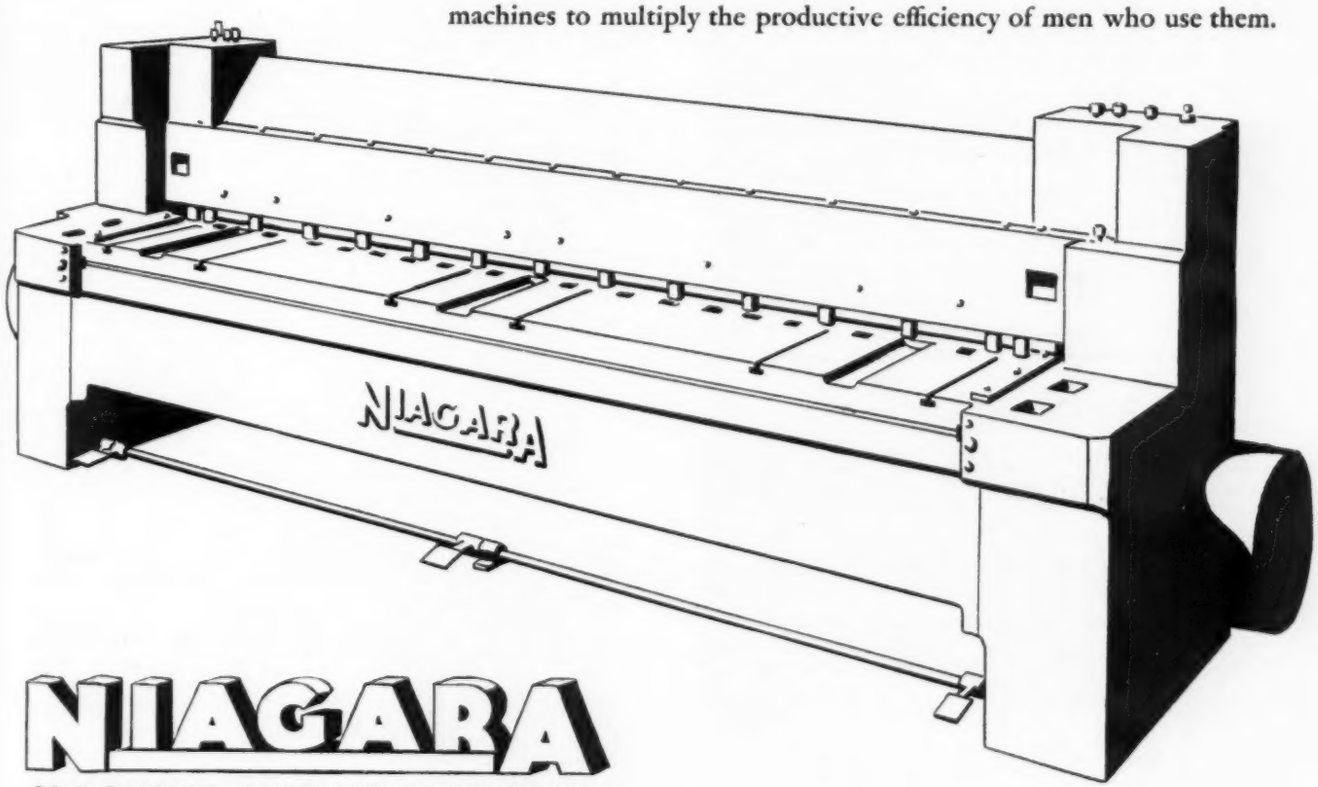
For Canadian price write Embassy Book Co., 12 Richmond Street E., Toronto 1.

Great Names in America's Progress

Thomas Alva Edison

America has been built by the creative genius of men who have contributed new ideas, new products, new improvements which make the world a better, brighter and happier place in which to live. The genius of Thomas Alva Edison gave us electric lights, motion pictures, phonographs and a host of other inventions which have built industries which have helped build America.

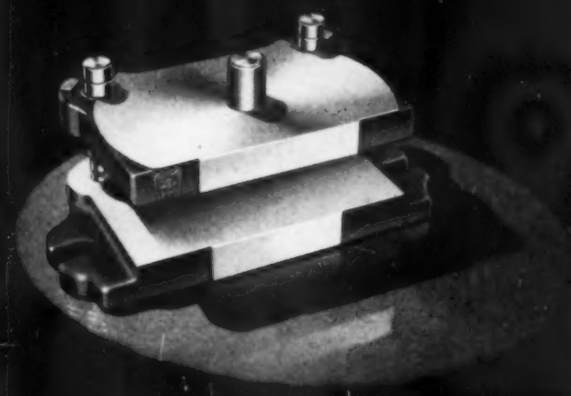
As builders of presses, shears and machines for sheet metal working, the men of Niagara appreciate their opportunity to help American people enjoy the better things of life,—thanks to the ability of Niagara machines to multiply the productive efficiency of men who use them.



NIAGARA
MACHINE AND TOOL WORKS

683 Northland Ave., Buffalo 11, N. Y. *District Offices:* CLEVELAND • NEW YORK • DETROIT

Die Sets for Every Stamping Job



Our constant endeavor to deliver a better product is the basis of our ever-increasing volume of business. We invite your inquiries regarding all-steel and semi-steel, standard and special die sets; dowel pins, cap screws, die springs and other accessories.

CALL "DETROIT"

DETROIT	TR 2-5150
INDIANAPOLIS	HU 5604
MINNEAPOLIS	AT 5264
DAYTON	HE 3042
TOLEDO	GA 5706
SEATTLE	SE 2090
PORTLAND, ORE.	AT 1466
SAN FRANCISCO	EX 7018
BUFFALO	PA 9206
PHILADELPHIA	VI 4-4084
ROCK ISLAND, ILL.	RI 743
LOS ANGELES	AD 7251
MILWAUKEE	ED 2359

DETROIT DIE SET CORPORATION
2895 W. GRAND BLVD. • DETROIT 2, MICHIGAN

DETROIT DIE SETS ★

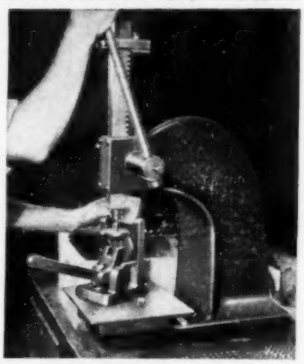
"1.4c A YEAR FOR MAINTENANCE"

famco

ARBOR PRESS

A POWERFUL MACHINE THAT NEEDS NO POWER

A manufacturer of automobile accessories and household appliances (name on request) has purchased 1,659 Famco Arbor Presses in the past decade for assembly operations. The cost to maintain these constantly busy machines averaged 14c per press over the 10-year period. These presses, in sizes to 15 tons pressure, require a small investment, speed up work, are easily portable, and save power and floor space. Write today for full details.



FAMCO MACHINE CO. • 1316 18TH ST. • RACINE, WIS.

famco (COST CUTTING) **machines**

ARBOR PRESSES • FOOT PRESSES • SQUARING SHEARS

FOR REAL TOOL ROOM ECONOMY

..TRY A LINLEY

Costs of making small dies, jigs, fixtures, patterns and models can be sharply reduced with a compact Linley Miller and Jig Borer . . . because setup is easy and change-over rapid on a variety of work. Keep your larger, more expensive machines working at their higher rated capacities.

All rotating parts are carefully balanced, giving the 8 spindle speeds (to 4250 r.p.m.) unusual operating smoothness . . . velvet-smooth feed . . . direct micrometer setting for high accuracy. Fits into any 2½ sq. ft. of space, and (7" x 17½") table top is ample for all requirements.

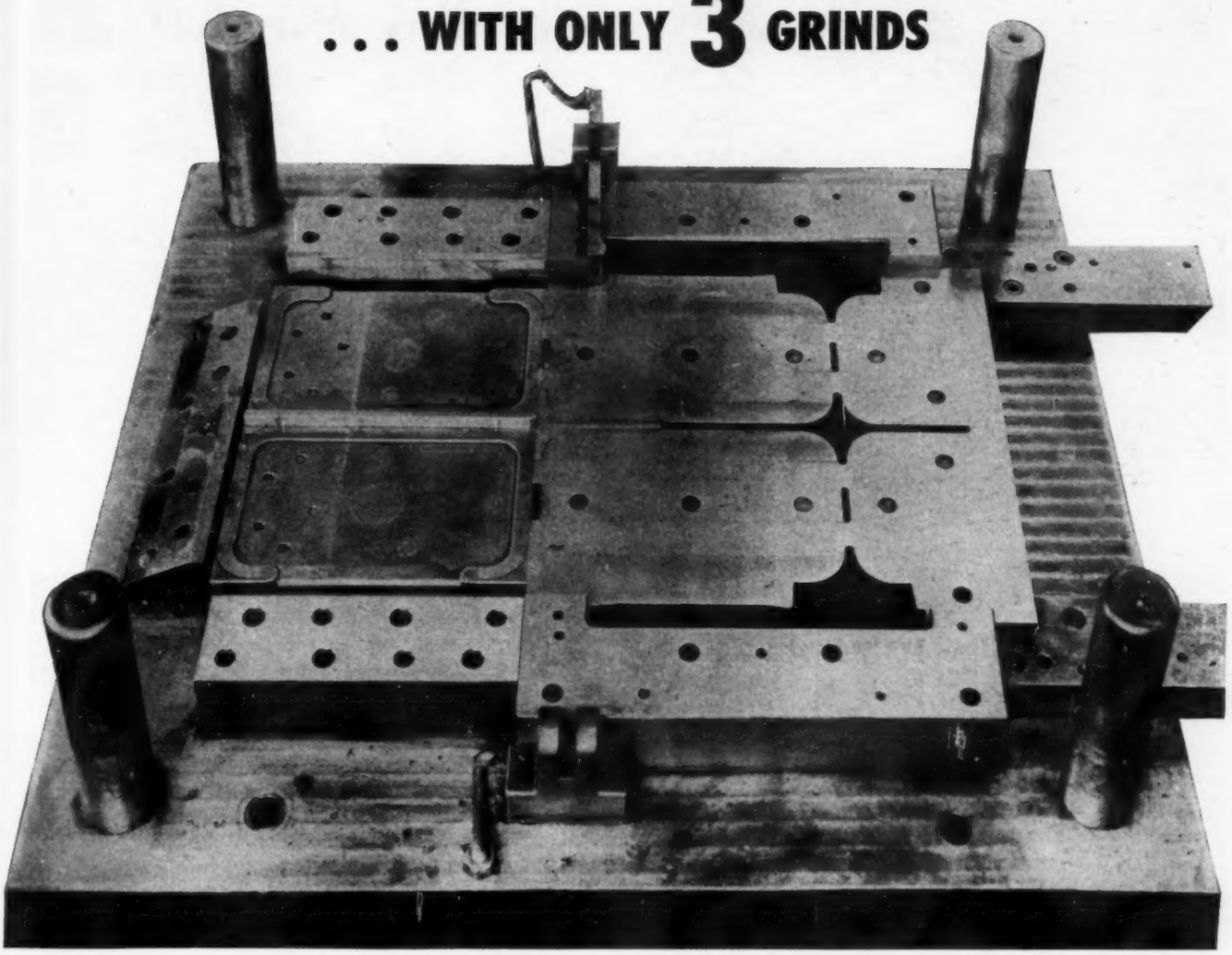
Investigate this profitable machine now.

SEND FOR BULLETIN

LINLEY BROTHERS COMPANY
664 STATE ST. EXTENSION
BRIDGEPORT 1, CONNECTICUT

Blanked 1½ Million Pieces

. . . WITH ONLY 3 GRINDS



It's a big figure—but not unusual when Bethlehem's Lehigh H is the die steel. The die shown here and its companion top die—both made of Lehigh H—were used for blanking from 22-gage cold-rolled steel sheet. Tough steel at that—yet only three grinds were required on a job that exceeded 1½ million pieces.

That's a pretty good example of what Lehigh H can do for you. But there's one vital factor that the figures don't reveal; namely, the very low distortion and dimensional change under heat-treatment. This has always been an outstanding characteristic of Lehigh H. And a highly valuable one, when you consider what distortion can do to a costly die.

In addition, Lehigh H has high shock- and abrasion-resistance. Air-hardening, it's an aristocrat of the tool room, yet it isn't at all temperamental. Try this dependable performer on your really tough jobs.

SUGGESTED USES FOR LEHIGH H

Blanking, punching, and forming dies; master tools and hobs; mandrels, gages; bending and forming rolls.

TYPICAL ANALYSIS

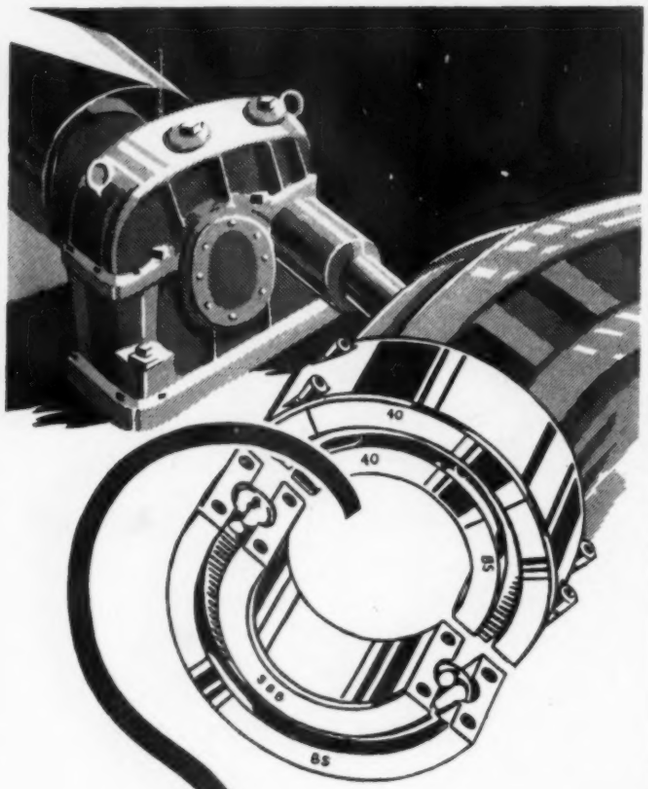
C 1.50 V 0.40 Cr 11.50 Mo 0.80

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

★ BETHLEHEM STEEL ★

LEHIGH H TEMPER . . . one of Bethlehem's BIG 8 Tool Steels



SPLIT BALLBEARINGS

Save Down-time!

When machine tools, process equipment, drives, pumps, etc. are down for repairs, Split Ballbearings can save tremendous down-time costs and reduce to a minimum production bottle-necks.

Split Ballbearings have high efficiency ratings. Are made to the same high standards as any other precision ballbearing. Can be used in installations where it would be impossible to install any other type of anti-friction bearing.

Investigate the time-saving and cost-reducing advantages of Split Ball, Thrust and Roller Bearings in your new designs and important redesigns. Latest catalog on request. Ask for bulletin AM-147.

·DIVISIBLE RACE BEARINGS·
SPLIT BALLBEARING CORPORATION
LEBANON, NEW HAMPSHIRE, U. S. A.

VALVAIR WON'T LEAK AFTER *Millions* OF OPERATIONS!

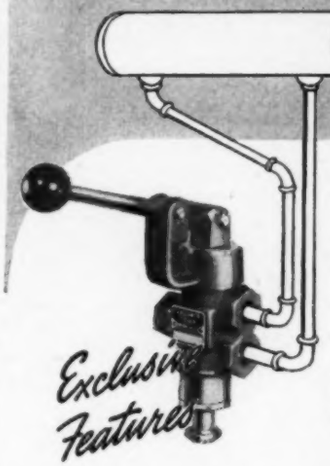


Diagram shows double-acting air cylinder operated by Valvair lever-operated 4-way valve.

Exclusive Features

Sensational performance? Perhaps; certainly thoroughly proven, thoroughly dependable; over 2,000,000 operations at 100 lbs. pressure and still going strong. Non-corrosive—cast bronze body, stainless steel parts; no metal seats to cause trouble; full pipe area utilized with minimum pressure drop. *A Valvair for every need:* 3 types, 8 designs, 5 sizes (¼" to 1").

Ask for our Bulletin AA or a Valvair representative.

VALVAIR CORPORATION • 454 Morgan Avenue, Akron 11, Ohio

Valvair

Fray "ALL-ANGLE" MILLING ATTACHMENT

EASY TO HANDLE
FLEXIBLE
UNIVERSAL • STURDY

It is an all purpose attachment which has thoroughly proved itself all over the world. Ideal for the making of plastic molds, die casting molds, permanent mold casting molds, metal patterns, tool and die making, production work of all kinds, as well as for grinding, drilling, boring, etc.

DIRECT DRIVE OR BACK GEARED
8 SPINDLE SPEEDS 125 TO 5200
For further information write Dept. C

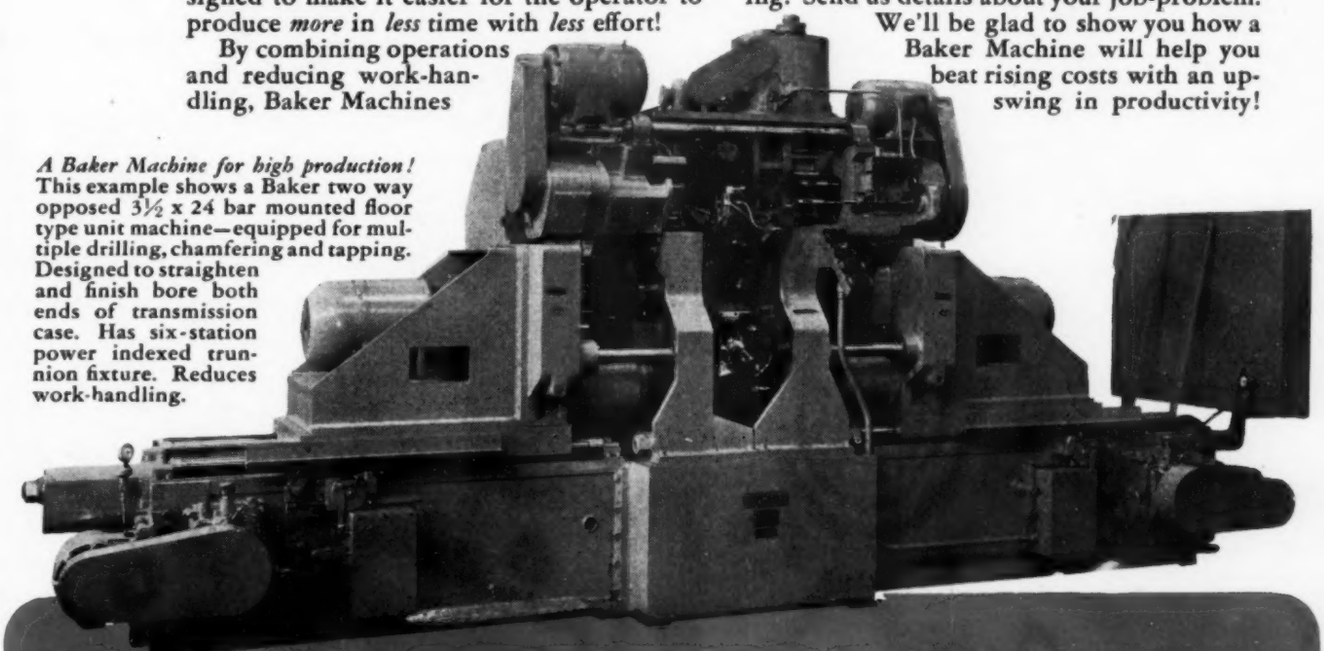
NATIONAL DISTRIBUTORS
H. LEACH MACHINERY CO.
387 CHARLES ST. PROVIDENCE 4, R. I.
AGENTS IN ALL PRINCIPAL CITIES

BAKER ... KEY TO Increased Productivity

A recent survey of industry shows that *new methods* and *new machines* are highly important factors today in obtaining *increased productivity.*

This is particularly true among users of Baker Machines—because every Baker is designed to make it easier for the operator to produce *more* in *less* time with *less* effort!

By combining operations and reducing work-handling, Baker Machines offer the right set-up for greater production and improved accuracy. Baker units are highly flexible... can be adapted to a wide range of operations including single or multiple spindle drilling, boring, reaming, counterboring, hollow milling and chamfering. Send us details about your job-problem. We'll be glad to show you how a Baker Machine will help you beat rising costs with an upswing in productivity!

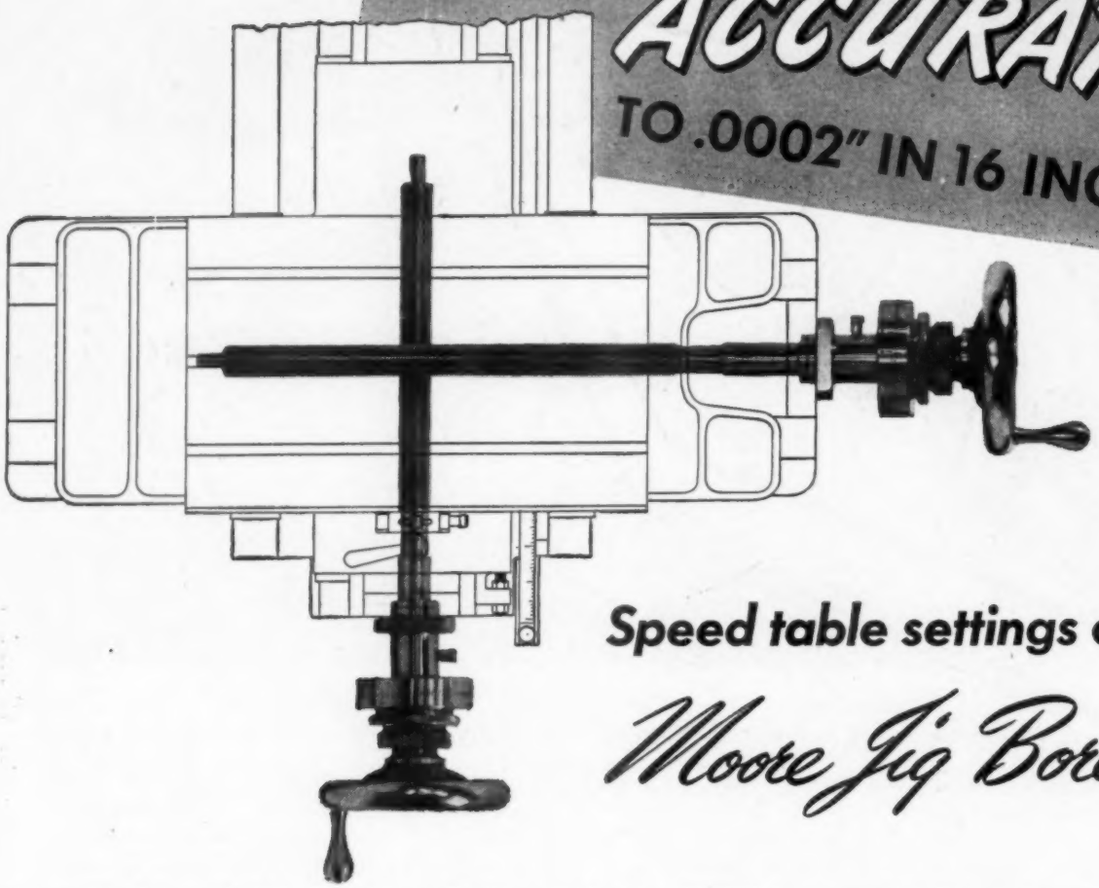


A Baker Machine for high production! This example shows a Baker two way opposed 3½ x 24 bar mounted floor type unit machine—equipped for multiple drilling, chamfering and tapping. Designed to straighten and finish bore both ends of transmission case. Has six-station power indexed trunnion fixture. Reduces work-handling.

BAKER BROTHERS-Inc. TOLEDO OHIO

DRILLING - BORING - TAPPING AND KEYSEATING MACHINES

LEAD SCREWS ACCURATE TO .0002" IN 16 INCHES



Speed table settings on the *Moore Jig Borer*

Accurate lead screws built into the Moore Jig Borer *mechanically* guide the work to precise location within .0001" *at a turn of the micrometer dials.* This exclusive principle in Jig Borer construction reduces the margin of human error on table settings and simplifies operation. The built-in accuracy of the lead screws also assures *constant* precision, unaffected by the temperature fluctuation encountered in the use of exposed size blocks or end measures. And this lead screw accuracy has been maintained even after ten years of constant operation in Moore machines.

Exclusive Moore methods of hardening, seasoning, stabilizing, thread-grinding and lapping enable the cross and longitudinal lead screws to give hole-location accuracy of .0002" over 16 inches of travel and .00005" from any given inch to the next.

With such dependable precision, table settings can be made rapidly and accurately in any position by the coordinate location method. On the Moore Jig Borer, you can spot, drill, bore and ream *all* holes in the work-piece consecutively, with minimum tool changes. In addition, each machine serves as its own "inspector."

See what this quick-starting system of hole location means to your operators—how it eliminates the conventional methods of stop-and-start to change tools at each hole. Then compare its production volume on your cost sheets.

Ask for your free copy of "Grinding Lead Screws—Accurate to .0002" in 16 inches" and descriptive literature on the Moore Jig Borer.

MOORE SPECIAL TOOL CO., INC.
738 UNION AVENUE, BRIDGEPORT 7, CONN.

MOORE JIG BORER

MOORE TOOLS

SPOTS, DRILLS, BORES, REAMS...WITH MINIMUM TOOL CHANGES

7 free Delta* bulletins

. . . helpful to have when you tackle your tooling problems

These Delta bulletins give you specific, detailed information on low-cost Delta Machine Tools. They cover things it pays to know before you make recommendations for purchases of equipment:

Product specifications. Prices. Motor recommendations. Accessory listings. Other necessary information.

If these detailed bulletins are not now in your possession, send for your free copies today.

Use the coupon below.

Bulletin A-31 pictures and describes Delta Abrasive Finishing Machines (belt and disk types), for sanding, polishing, and finishing operations.

Bulletin A-14 gives you facts about Delta 14-inch Drill Presses—bench and floor types; 1, 2, 3, 4, 5, 6, and 8-spindle models.

Bulletin A-14-3 covers 1, 2, 3, and 4-spindle Delta Super-Hi*-Speed Drill Presses, for small-hole work from .025" diameter to ¼".

Bulletin A-17 discusses Delta 17-inch Drill Presses — bench and floor types; 1, 2, 3, 4, 5, 6, and 8-spindle models, with hand or power feed.

Bulletin A-23 includes information on Delta Toolmaker* Surface Grinder, Chip-Breaker Grinder, Tool and Cutter Grinder, Carbide Tool Grinder, Industrial Tool Grinder.

Bulletin A-28 tells about the Delta 14-inch Metal-Cutting Band Saw, for cutting almost anything from carbon steel to asbestos.

Bulletin A-20 gives information on Delta Cut-Off Machines — non-ferrous model; abrasive model (adaptable to wood-cutting model).

TEAR OUT COUPON AND MAIL TODAY!

DELTA MANUFACTURING DIVISION, 608A E. Vienna Ave., Milwaukee 1, Wisconsin

Send me free copies of the Delta bulletins checked below:

- ☐ Bulletin A-31 *(Abrasive Finishing Machines)*
- ☐ Bulletin A-14 *(14-inch Drill Presses)*
- ☐ Bulletin A-28 *(Metal-Cutting Band Saw)*
- ☐ Bulletin A-14-3 *(Super-Hi-Speed Drill Presses)*
- ☐ Bulletin A-23 *(Grinders)*
- ☐ Bulletin A-17 *(17-inch Drill Presses)*
- ☐ Bulletin A-20 *(Cut-Off Machine)*

Name.....

Position.....

Company.....

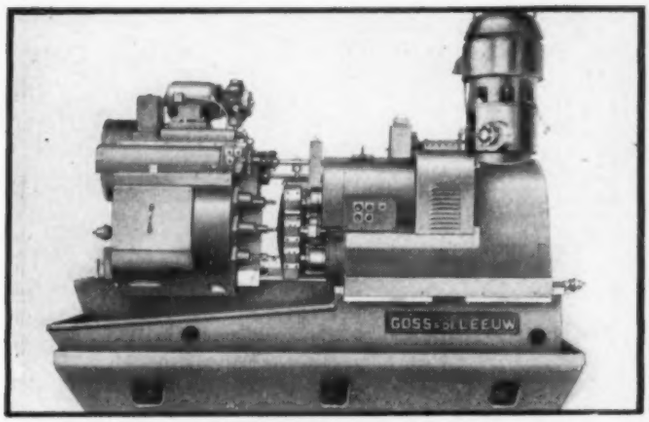
Address.....

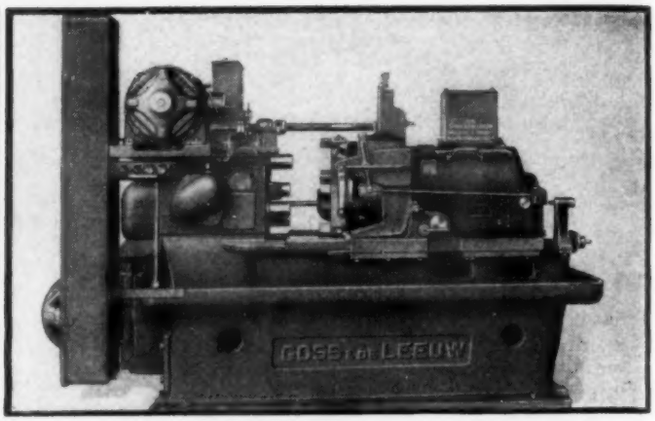
City.....(.....) State.....

ROCKWELL DELTA MILWAUKEE
REG. U.S. PAT. OFF.

Delta Manufacturing Div.
Rockwell Manufacturing Company
Milwaukee 1, Wisconsin

*Trade Mark Reg. U. S. Pat. Off. M-21





GOSS & DE LEEUW *Multiple Spindle* CHUCKING MACHINES

TOOL ROTATING TYPE
4 Spindles
5 Chucking Positions

Features include:

Lead Screw Threading on both types—Preloaded Anti Friction Spindle Bearings—Hardened Ways—Oversize Spindles—Gears of Chrome-nickel steel, carefully heat-treated.

Write for copy of descriptive catalog giving complete, detailed specifications.

WORK ROTATING TYPE
5 Spindles
6 Spindles
8 Spindles

GOSS & DE LEEUW MACHINE CO., NEW BRITAIN, CONN.

BUHR *Announces Superized* Ball Bearing Adjustable DRILL HEADS!

For Speed, Economy, Accuracy and Production!

Improved Construction — Induction Hardened Shaved Gears

Buhr adjustable heads have been used economically for intermittent set ups on short orders and large production jobs. They are made in sizes and number of spindles to fit any ordinary layout of holes. Buhr ball bearing heads have been the pioneers in ball bearing construction and shaved gears. Adapters are separate and are interchangeable from one press to another. They are so constructed the operator can quickly set the head in any desired radial position to suit drill jig and drill press quill.

A Few of the Possible Spindle Arrangements of the 16-FV Head

The 16-FV head shown has 6 spindles which will carry the maximum size drill of 7/16" in cast iron, the minimum distance between spindles 1½". The diameter of the circle adjustment is 3¾" minimum to 13¼" maximum. The heads are self-contained and parts are running in light grease. Spindles can be furnished in 3 types, with Morse tapers, for standard drill chucks, or for Buhr collets. 16FV

DELIVERY NOT EXCEEDING 2 WEEKS

On models 02-03-12-13-14-16-18. Write for Literature or Send Blue Prints.

BUHR Machine Tool Co.

GREEN & DAVIS STREETS

ANN ARBOR, MICHIGAN

Automobile Engine Builders...

DOES TAPPING 1645 HOLES PER HOUR IN 4-CYLINDER HEADS INTEREST *You?*

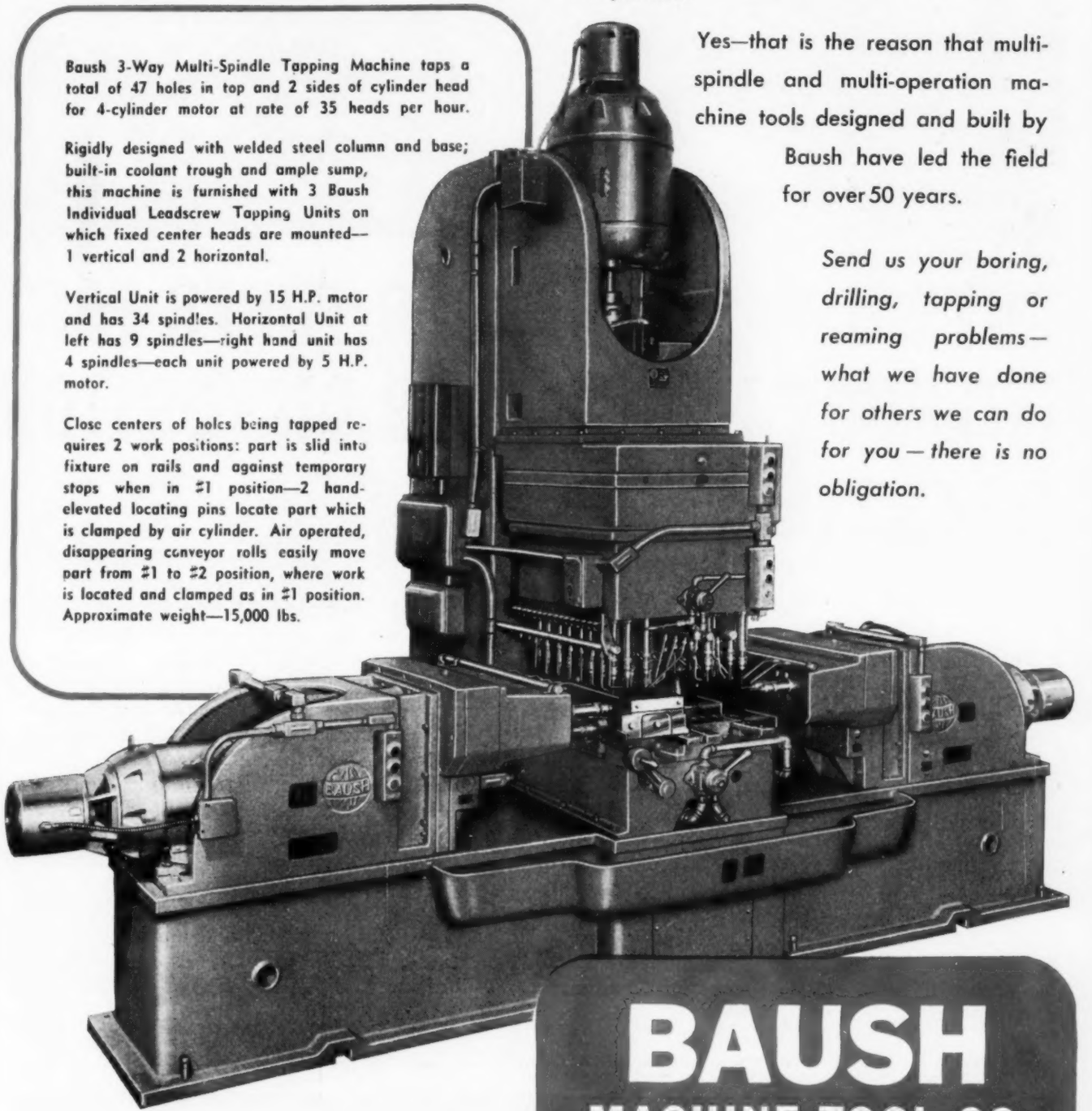
If it does, check this example of fast, efficient and economical production with multi-spindle machine tools designed for a specific job—the type of equipment that meets today's needs and competition.

Baush 3-Way Multi-Spindle Tapping Machine taps a total of 47 holes in top and 2 sides of cylinder head for 4-cylinder motor at rate of 35 heads per hour.

Rigidly designed with welded steel column and base; built-in coolant trough and ample sump, this machine is furnished with 3 Baush Individual Leadscrew Tapping Units on which fixed center heads are mounted—1 vertical and 2 horizontal.

Vertical Unit is powered by 15 H.P. motor and has 34 spindles. Horizontal Unit at left has 9 spindles—right hand unit has 4 spindles—each unit powered by 5 H.P. motor.

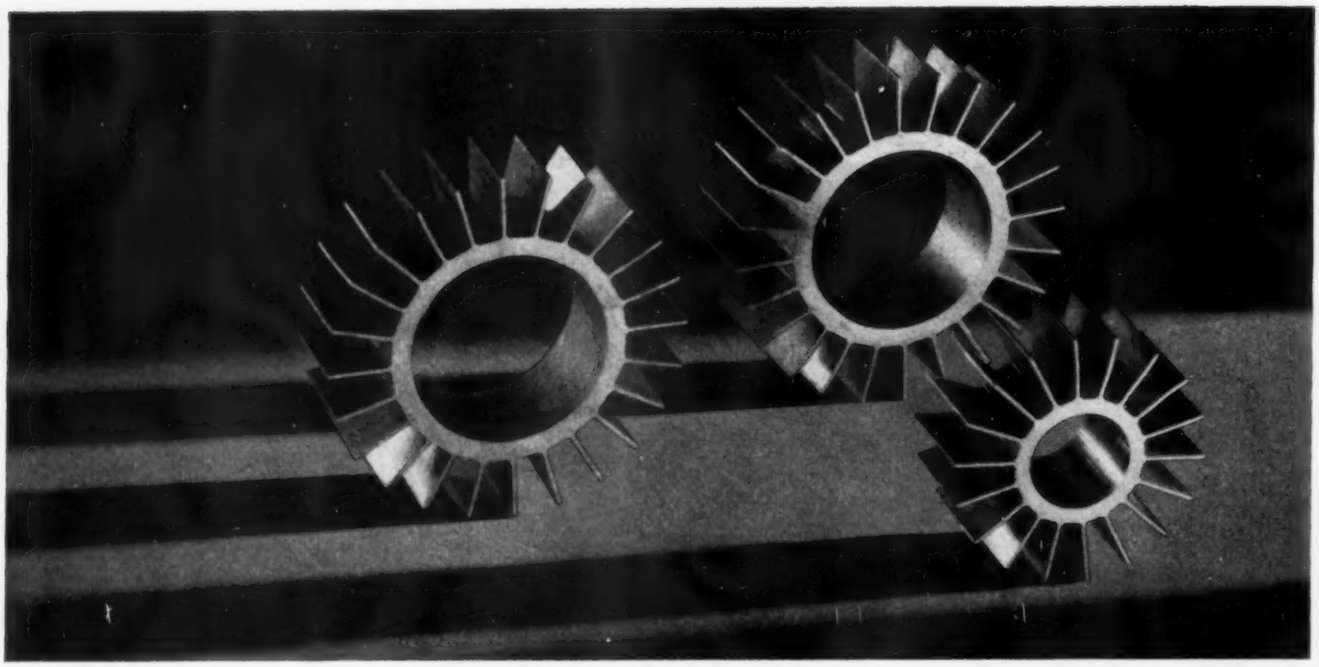
Close centers of holes being tapped requires 2 work positions: part is slid into fixture on rails and against temporary stops when in #1 position—2 hand-elevated locating pins locate part which is clamped by air cylinder. Air operated, disappearing conveyor rolls easily move part from #1 to #2 position, where work is located and clamped as in #1 position. Approximate weight—15,000 lbs.



Yes—that is the reason that multi-spindle and multi-operation machine tools designed and built by Baush have led the field for over 50 years.

Send us your boring, drilling, tapping or reaming problems—what we have done for others we can do for you—there is no obligation.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS

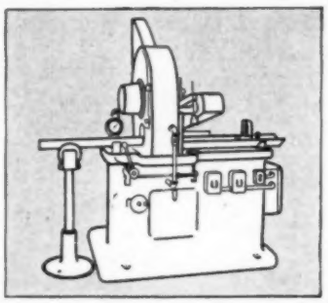


CUTS HEAT EXCHANGER TUBES FAST WITHOUT BENDING OR DISTORTION

Campbell Abrasive Cutter solves problem of cutting finned heat exchanger tubes. Hydraulically-controlled machine with Campbell-designed fixture permits fast, light-pressure cutting without bending or distortion of thin metal fins. Reduces rejects. Makes speedy production job of otherwise almost impossible operation.

BRIDGEPORT, CONN.—The No. 401 CAMPBELL Cutamatic cuts these 2⅛" O.D. brass finned tubes in 12 seconds. Steel tubes of similar design are cut in 15 seconds. Cuts are clean and smooth. No finishing is necessary. Texture and shape of metal are not changed. Operating costs are low. Practically no rejects.

CAMPBELL makes a complete range of abrasive cutting machines. There are hand-operated, semi-automatic and full-automatic



models for regular production work. Plastics, ceramics and glass, annealed or unannealed and non-ferrous metals in solids, tubes, angles, channels, or odd shapes up to 10" O.D. can be cut.

New applications of CAMPBELL Abrasive Cutting Machines are developed to replace other methods of production machining. If you have a special problem which might possibly involve abrasive cutting, why not do this? Write and tell us (1) the range of sizes, (2) kind of material, (3) length of cutoff pieces, (4) length of stock before cutting, (5) tolerance for length of cut pieces, and (6) hourly production requirement. CAMPBELL engineers will recommend production procedure and work up cost sheets for you.

ACCO

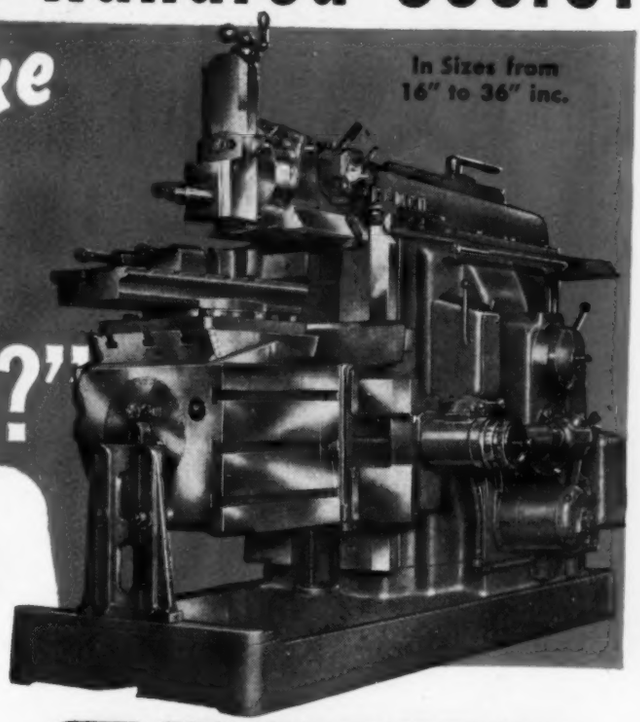
ALSO MAKERS OF A COMPLETE LINE OF NIBBLING MACHINES

TRADE MARK

ANDREW C. CAMPBELL DIVISION
AMERICAN CHAIN & CABLE • BRIDGEPORT, CONN.

We Asked Several Hundred Users:

"What Do You Like Most About GEMCO Shapers?"



Here Are the 10 Most Popular Features and Advantages:

1. "Rugged, rigid and accurate, giving work a precision finish."
2. "Lubrigard Safety Device."
3. "Wide range of feeds and speeds; saves time and tools."
4. "Power rapid traverse a time saver."
5. "Our operators and tool-makers enthusiastic in general."
6. "Universal table is big, useful, time-saving."
7. "Quiet, smooth-running, easily adjusted, easy to operate."
8. "Centralized Controls."
9. "No breakdowns, small maintenance cost."
10. "Time-saving, resulting in lower production costs."

GEMCO

Multi-Purpose SHAPERS

Write Today for
BULLETIN GC-12A

GENERAL
ENGINEERING & MFG. CO.
ST. LOUIS 16, MO.

MANUFACTURERS OF
PRECISION MACHINERY
SINCE 1917

MOREY *Universal* TURRET LATHES
for BAR or CHUCKING

THE TURRET LATHE *Your Operator* APPROVES!

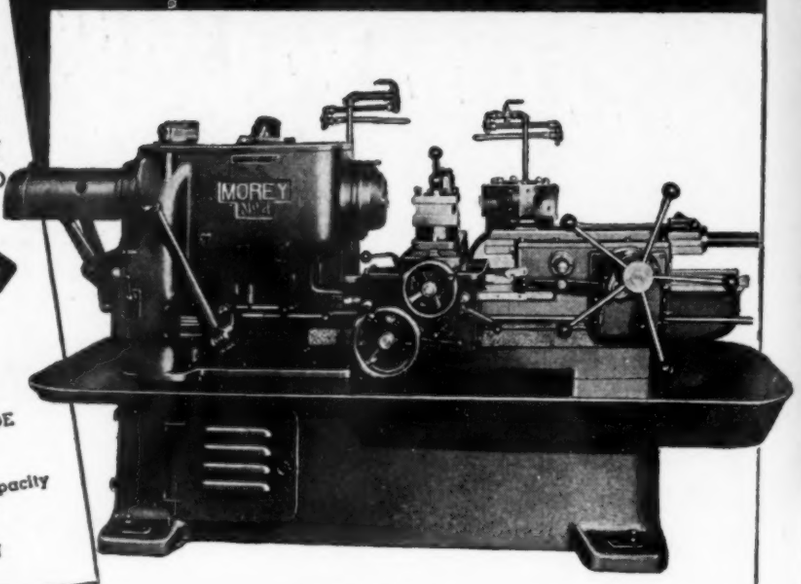
EASY TO OPERATE • ACCURATE
DEPENDABLE • RIGID AND
POWERFUL ENOUGH TO FULLY
UTILIZE PRESENT-DAY HIGHSPEED
CARBIDE TOOLS

#4 UNIVERSAL

For bar stock up to 2" in diameter
12" turning length 19½" swing over bed
Infinite spindle speeds: 35 to 1500 RPM.
constant speed motor. 1200 RPM
MAY BE HAD WITH PLAIN CROSS SLIDE

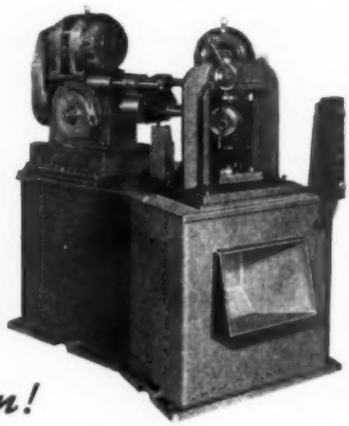
Also available in
No. 3 Universal, 1½" capacity
No. 2 Plain, 1" capacity

ASK FOR DESCRIPTIVE BULLETIN



STOCK DELIVERY

DESIGNED AND BUILT BY
MOREY MACHINERY CO., INC 410 BROOME STREET, NEW YORK 13, N. Y.
PLANT: 4-57 26TH AVE., ASTORIA 2, NEW YORK



Increase your production!

240 PARTS PER HOUR WITH THIS *Bradford* TAPPING MACHINE

Bradford Reversing Motor Tapping Machine composed of one single spindle unit and one unit equipped with two-spindle multiple drill head. Electric controls govern entire operation.

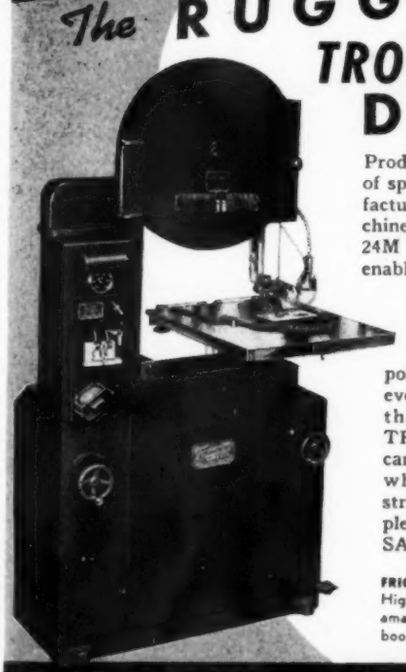
Taps three 5/16" holes in a transmission case at the rate of 240 parts per hour.

This machine, like all Bradford machines, has been proved on the production line.

Write for Bulletin 500

The BRADFORD MACHINE TOOL CO.
1840 1946 CINCINNATI, OHIO

Tannewitz
The RUGGED-TROUBLE-FREE DI-SAW



Product of more than 50 years of specialization in the manufacture of band sawing machinery the TANNEWITZ 24M is the machine that will enable you to capitalize to the fullest extent on the economies of contour sawing, inside and outside filing and polishing. It's rugged, with every detail of construction thoroughly proved, — TROUBLE-FREE. And it carries full 24-inch wheels which make for easier, straighter sawing. For complete details write for DI-SAW Bulletin.

FRICTION SAWING with Tannewitz High Speed Band Saws offers many amazing advantages. Write for free booklet.

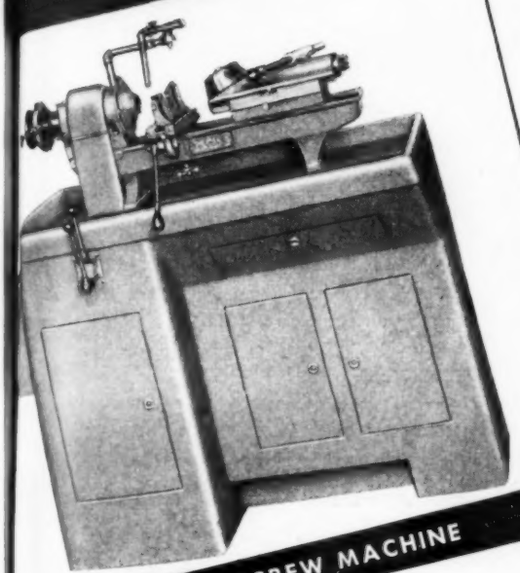
THE TANNEWITZ WORKS
GRAND RAPIDS 4, MICHIGAN

DoALL *Precision Lathes*

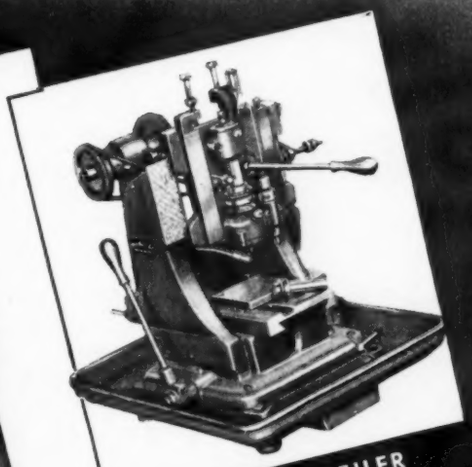
For toolroom and production use, DoALL Precision Lathes are extremely sensitive and highly accurate. Floor or bench models in several sizes. Quick high-low speed changes; quick stops; ease of setup and operation. Rugged strength and durability permit fast, continuous productoin within precision tolerances. Special draw-in collets with buttress-type thread — no thread-stripping problems. Bed is strongest known design for weight—has adjustable gibbed ways directly above sides. This lathe has versatility previously considered beyond capacity of similar size lathes.

And . . .

DoALL Hand Screw Machines—2 models with collet capacities of 2" and 1 7/8" swing and combined speed range of 315 to 5300 r.p.m. Also DoALL Bench Profilers for profiling, milling, slotting, recessing and routing numerous small parts. Working area of 2" by 4" horizontal and 1½" vertical. Equipped with collet to hold cutting tools.



HAND SCREW MACHINE



BENCH PROFILER

WRITE FOR ILLUSTRATED CIRCULAR

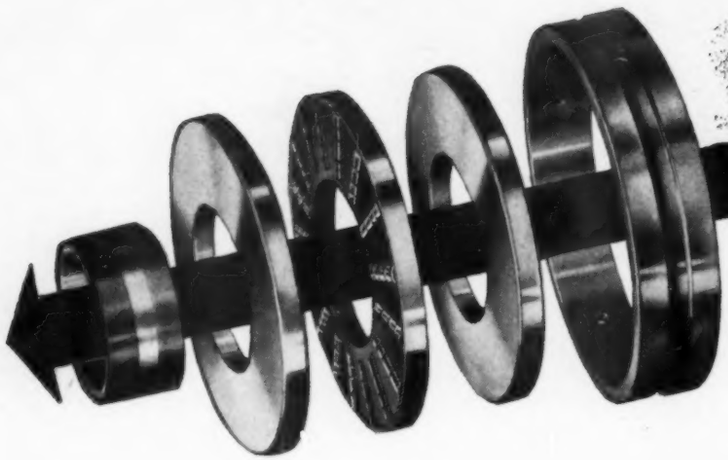
The DoALL *Company*

Reg. U. S. Pat. Off.

DoALL STORES IN PRINCIPAL CITIES

DES PLAINES, ILLINOIS

WHY IS RIGHT-ANGLE LOADING BETTER?



It assures longer bearing life . . .

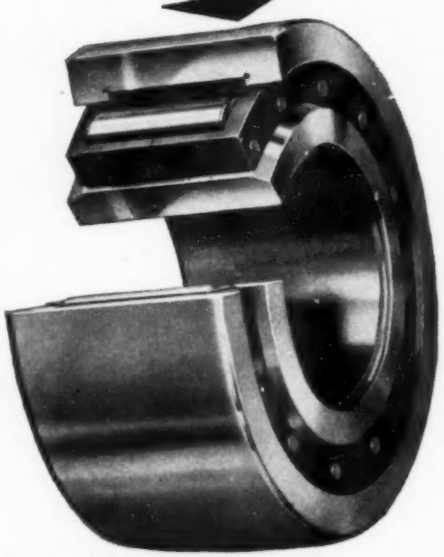
Permits heavier radial and thrust loads . . .

Reduces load on each individual roller . . .

Cuts down service attention . . .

ROLLWAY Right-Angle-Loaded BEARINGS have *every one* of these advantages because they reduce every load to its component parts—*pure radial and pure thrust* . . . and carry *each* of these loads on a *separate* bearing assembly—AT A RIGHT ANGLE TO THE ROLLER.

Because of this, Rollway Bearings can use solid cylindrical rollers of greater mass and cross-section area in a given space. Result: *increased load capacity . . . reduced maintenance attention . . . longer wear, with no pinching or wedging, less friction on roller ends.*

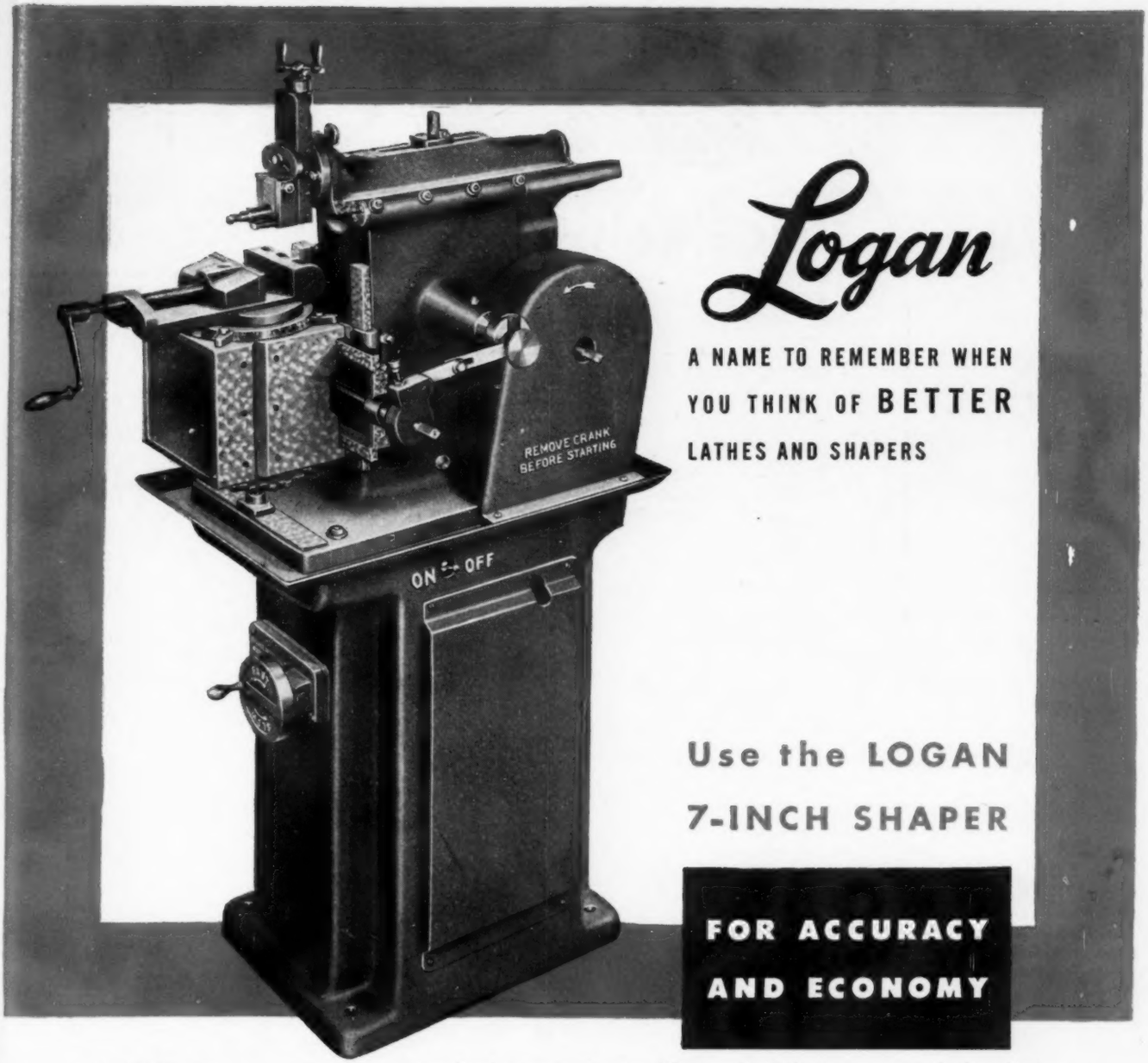


Send us your plans today for engineering analysis and bearing recommendations.

ROLLWAY BEARING CO., INC.
Syracuse, N. Y.

SALES OFFICES:
Philadelphia Boston Pittsburgh Youngstown Cleveland
Detroit Chicago St. Paul Houston Los Angeles

Rollway CYLINDRICAL ROLLER BEARINGS



Logan

A NAME TO REMEMBER WHEN YOU THINK OF **BETTER** LATHES AND SHAPERS

Use the LOGAN 7-INCH SHAPER

FOR ACCURACY AND ECONOMY

brief Logan Shaper specifications

Length of ram travel, 7⅝" . . . strokes per minute, "Anyspeed," 64 to 175 . . . length of bearings, main frame, 10" . . . length of ram, 16⅛" . . . width of ram, 5" . . . table traverse, 10½" . . . table vertical travel, 5½" . . . table length, 8" . . . table width, 8" . . . table depth, 1½" . . . saddle bearing, 6" . . . toolhead travel, 2⅜" . . . toolhead swivel, 360° . . . toolhead diameter, 4" . . . Cross feeds, 6 (.002, .004, .006, .008, .010, .012) . . . Sprocket and chain drive . . . vise 5" x 5" x 1½" . . . motor, ½ hp, 1750 rpm . . . Height over all, 51" . . . Shipping weight, shaper, stand and motor, 585 lbs.

Any shaping operation involving work within its range can be handled on a Logan Shaper at savings in set-up time and power cost, with no sacrifice in accuracy. Advanced in design, massively built throughout, with extra weight at vital points, and equipped with a positive, slip-proof roller chain drive, the Logan Shaper is smooth and accurate, even on heavy cuts. Any speed desired from 64 to 175 strokes per minute is constantly available through the "Anyspeed" Control. Operation is simple. Speeds can be changed instantly, without stopping the motor or shifting the belt. The ram is micro-set by a simple screw adjustment. There are six automatic feeds in either direction, from .002" to .012", with a half turn of the feed handle reversing the feed. The tool head may be swiveled and instantly re-set to center by means of tapered locating pins, an exclusive Logan feature. In any shop, large or small, the Logan Shaper quickly proves its all-round efficiency, wide range of feeds and speeds, and accurate, economical operation. Full particulars at your Logan dealer's, or on written request.

DISTRICT OFFICES

WOOLWORTH BLDG.
NEW YORK 7, N. Y.
CORTLANDT 7-8024

550 W. WASHINGTON BLVD.
CHICAGO 6, ILLINOIS
CENTRAL 1246

1672 MISSION STREET
SAN FRANCISCO, CALIF.
UNDERHILL 6682

R-1

LOGAN ENGINEERING CO. CHICAGO 30, ILLINOIS

Consider these facts

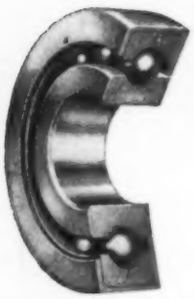
ABOUT

NICE Ball Bearings

- Their inexpensive design and high rate of automatic production make for *low cost.*
- Inch standard sizes and dimensions make for simple, convenient engineering design and application.
- The soft steel outer band on many types makes a press housing fit easy and inexpensive.
- Will often readily replace common friction washers and bushings at little or no extra cost.
- Can frequently be used to replace expensive precision bearings not warranted by less exacting conditions of speed, load and accuracy.
- More than 600 "standards" and over 2000 "specials" provide for a majority of all requirements. Standards are normally available from stock.
- Almost all standards and specials can be made of special materials such as brass, bronze, Monel metal and stainless steel.
- New "specials" to meet individual requirements can be made when the quantity involved warrants tooling.

• NICE now producing "series 1600", a new inch size line of low cost, deep groove precision radial bearings, with solid inner and outer rings and ball retainer. Furnished with or without grease shields.

Write for New Catalog No. 125



"100" Series Ground Deep Groove Radial, Full Ball Type, Soft Outer Band, Inch Sizes.

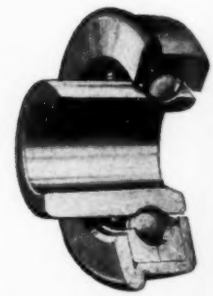
"1200" Series, Similar "400" Series Except Double Row.

"500" Series Unground Radial and Thrust, Full Ball Type, Pressed Cone, Soft Outer Band, Inch Sizes.

"600" Series Self Contained Unground Thrust, Full Ball Type, Soft Outer Band, Inch Sizes.

Ground Thrusts, Series "1000", 1100", "2600" and "2700", with Retainer, Inch and Metric Sizes.

"400" Series Unground Deep Groove Radial, Full Ball Type, Soft Outer Band, Inch Sizes.



"Flanged" Series, Similar "400" Series Except Outer Band Flanged.

"700" Series Unground Radial and Thrust, Full Ball Type, Solid Cone, Soft Outer Band, Inch Sizes.

"K" Series (Aircraft and Commercial) Precision Deep Groove Radial, Full Ball Type, Double Shielded, Inch Sizes.

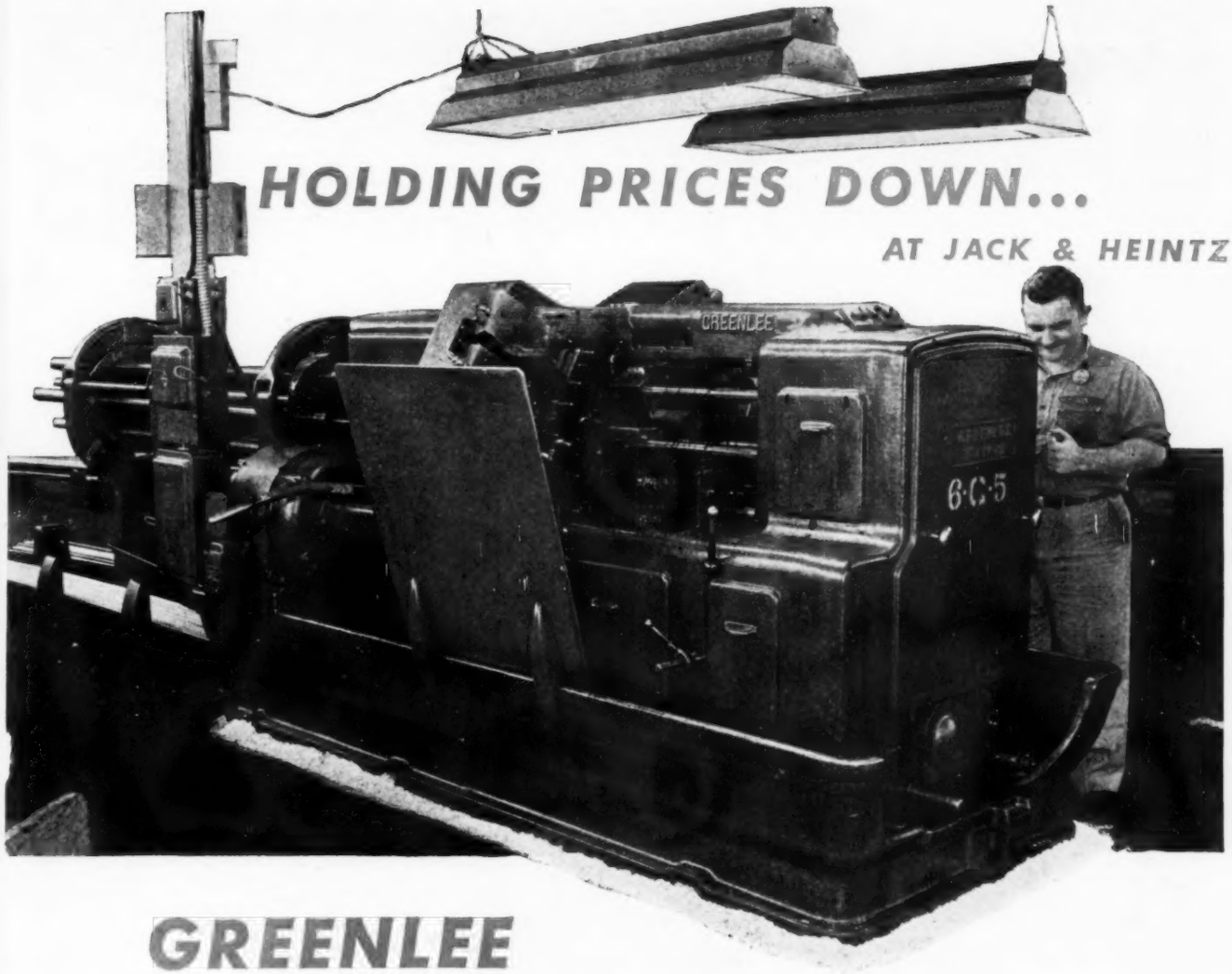
NICE

NICE BALL BEARING COMPANY

NICETOWN · PHILADELPHIA · PENNSYLVANIA

HOLDING PRICES DOWN...

AT JACK & HEINTZ



GREENLEE SIX-SPINDLE AUTOMATICS

This FHP Motor Armature Shaft is one of the many parts made on Greenlee Automatics at Jack & Heintz Precision Industries, Inc., Cleveland, Ohio. The production rate is 100 per hour per machine. Stock: SAE X-1335 CRS, 13/16" bar diameter, overall length 9-29/32". Other parts produced are bearing races, magneto rotor shafts, and aircraft accessory parts.

During war years, the efficiency of men and machines of "Jahco" made history. Then, even as today, the company's policies were based on the premise that low prices keep a company in business . . . that low prices, as well as high wages, are made possible by efficient production.

In 1942, Jack & Heintz Inc., (now Jack & Heintz Precision Industries, Inc.) purchased their first Greenlee 6-Spindle Automatics — six 1-5/8" machines. Today, on normal production work, these machines have a permanent berth in the "Jahco" economy. Their efficiency, versatility, and ease of operation are considered important features useful in "Jahco's" production plans for the future.

The Greenlee "6", for example, lends itself to efficient production of many short run jobs . . . lots of 1,000 or 2,000 pieces. With no cams for main tool-slide and with standard interchangeable cams for cross-slide operations, the Greenlee is easy to use, economically, in a planned production scheme. The low machine height and wide-open tooling area are factors that speed set-ups, reduce operator fatigue, and build morale . . . reasons why the Greenlee is widely accepted as the operator's favorite.

Write now for details on other cost-saving Greenlee features. Ask to see the new 30-minute sound movie showing the building of a Greenlee "6" from foundry to finished product.

PRODUCTION MACHINERY

GREENLEE

GREENLEE BROS. & CO.
1721 MASON AVE.
ROCKFORD, ILLINOIS

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

Proven Performance

SELLS 6 OUT OF 10 GRAND RAPIDS GRINDERS

Of every ten Grand Rapids Hydraulic Feed Surface Grinders sold, six are to customers already using Gallmeyer and Livingston grinding machinery.

Such customer acceptance and approval is proof of the quality of Grand Rapids Grinders.

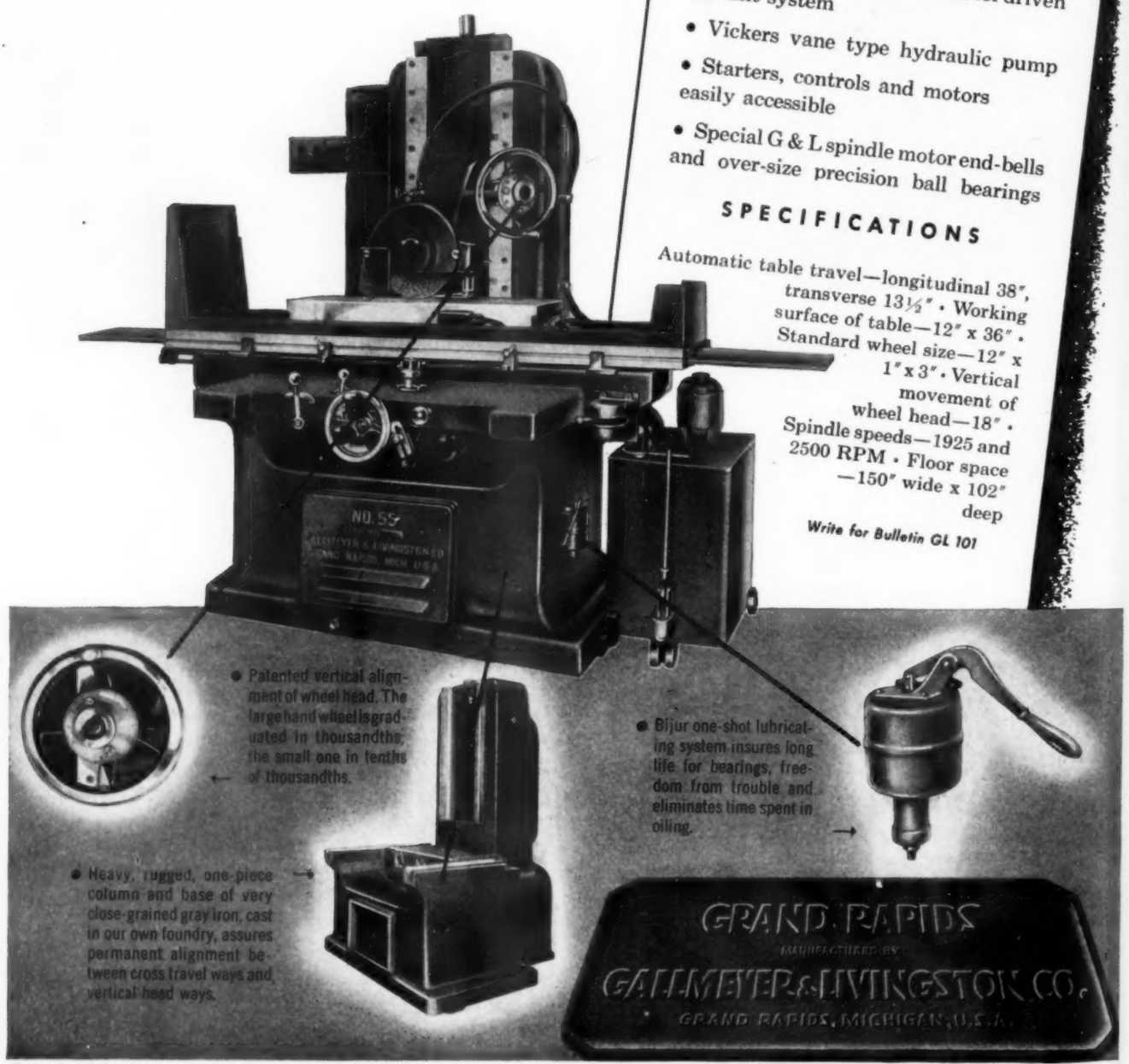
FEATURES

- 125 feet per minute longitudinal table speed
- Separate motors to drive grinding wheel spindle and hydraulic mechanism
- Two spindle speeds to reduce wheel costs
- Portable, self-contained motor driven coolant system
- Vickers vane type hydraulic pump
- Starters, controls and motors easily accessible
- Special G & L spindle motor end-bells and over-size precision ball bearings

SPECIFICATIONS

Automatic table travel—longitudinal 38", transverse 13½" • Working surface of table—12" x 36" • Standard wheel size—12" x 1" x 3" • Vertical movement of wheel head—18" • Spindle speeds—1925 and 2500 RPM • Floor space —150" wide x 102" deep

Write for Bulletin GL 101

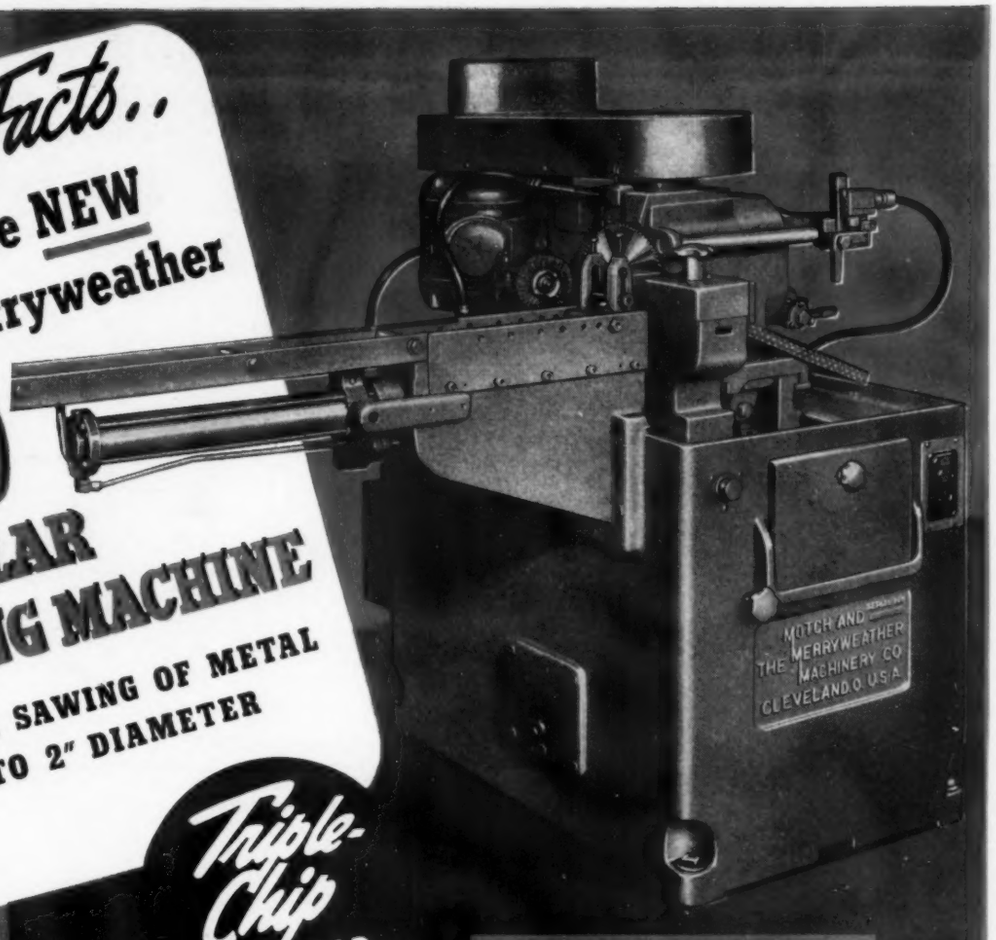

NO. 55
• Patented vertical alignment of wheel head. The large hand wheel is graduated in thousandths, the small one in tenths of thousandths.
• Bijur one-shot lubricating system insures long life for bearings, freedom from trouble and eliminates time spent in oiling.
• Heavy, rugged, one-piece column and base of very close-grained gray iron, cast in our own foundry, assures permanent alignment between cross travel ways and vertical head ways.
GRAND RAPIDS
MANUFACTURED BY
GALLMEYER & LIVINGSTON CO.
GRAND RAPIDS, MICHIGAN, U.S.A.

GALLMEYER & LIVINGSTON COMPANY, 330 STRAIGHT ST., S. W., GRAND RAPIDS 4, MICHIGAN

Get the Facts.. on the NEW Motch & Merryweather No. 00 CIRCULAR SAWING MACHINE

FOR THE SAWING OF METAL 1/4" TO 2" DIAMETER

Triple-Chip METHOD



No. 00 AUTOMATIC COLD SAW

You can now enjoy the proven superiority of the Motch & Merryweather Triple-Chip Method in the circular cold sawing of metal, ferrous and non-ferrous, up to 2" diameter. The new No. 00 Automatic pictured here has the fundamental advantages of the larger Motch & Merryweather machines, together with important new features. You get speed, smooth cuts and freedom from burrs that often eliminate secondary operations, solidity and rigidity which mean long life and continuous profit-making. In many cases you can eliminate milling cut-off operations. Four models to meet every requirement:

AUTOMATIC • SEMI-AUTOMATIC • POWER FEED • MANUAL

Ask for your copy of our new, well illustrated 12-Page Bulletin A-1.

Only M&M builds ALL 3: COLD SAW SAW BLADE BLADE GRINDER

Also...

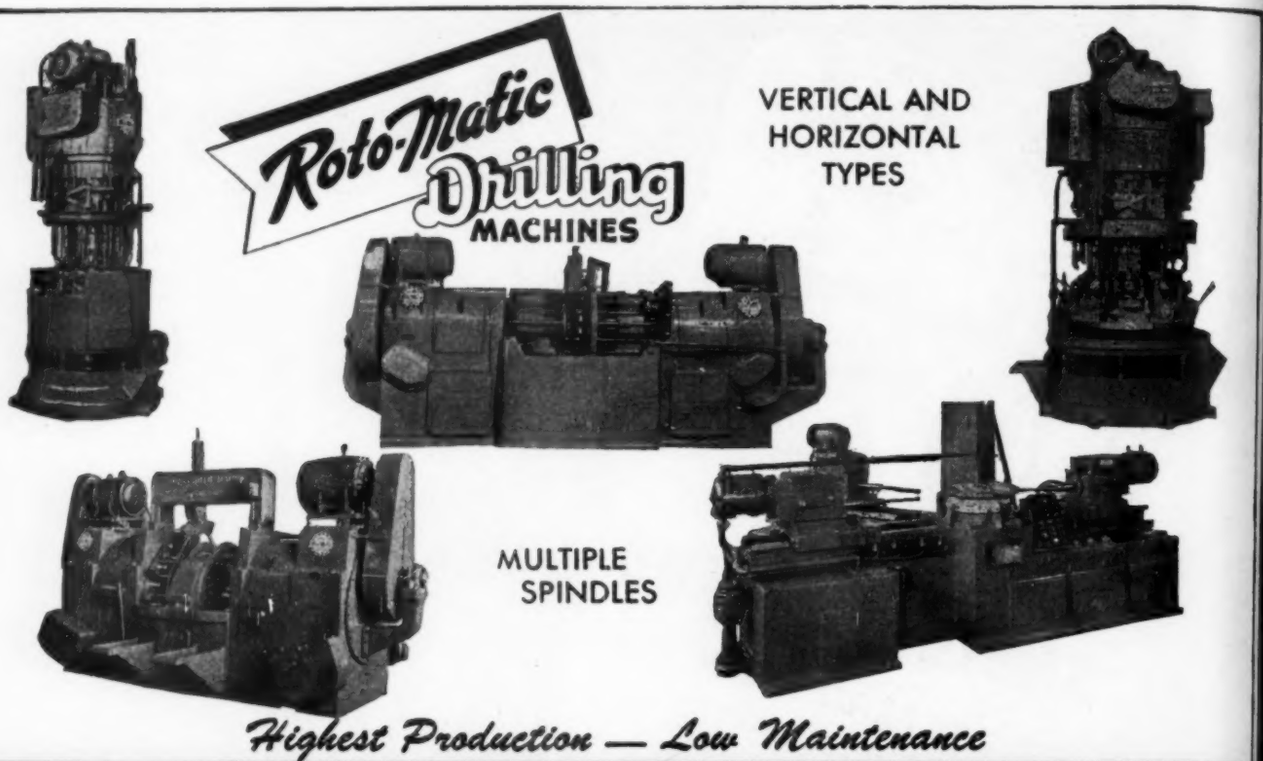
THE No. 2
Circular Sawing Machine for stock up to 6 inches

THE No. 3
Circular Sawing Machine for stock up to 10 inches

THE No. 4
Circular Sawing Machine for stock up to 16 inches

Write for our Bulletins on these machines, too.

THE MOTCH & MERRYWEATHER MACHINERY CO.
PENTON BUILDING CLEVELAND 13, OHIO



Highest Production — Low Maintenance

MILLING • DRILLING • REAMING • BORING • PIPE THREADING • SPECIAL MACHINES

DAVIS & THOMPSON COMPANY

MANUFACTURERS: MACHINE TOOLS, MICROMETERS AND GAGES

MILWAUKEE WISCONSIN

40 YEARS OF EXPERIENCE produced
THE NEW COULTER
AUTOMATIC THREADING LATHE
The many different and number of threading tools which can be arranged on the tool slides both front and rear, make this machine the most versatile of any for production of square, standard, and 29 degree threads, both internal and external
Equipped with disc clutch. . . . Easy to operate. . . . Rigid Construction. . . . Four speed headstock. . . . Return or Idle travel speed has been increased five times cutting speed.
PRODUCTION MACHINES SINCE 1896
Write for full particulars
The James COULTER Machine Co.
BRIDGEPORT • CONNECTICUT • U.S.A.

These Steels take the "HACK" OUT OF HACK SAW BLADES

When you order hack saw blades from your regular supplier, make it a rule to specify blades made of "Ingersoll 18-4-1" or of "Ingersoll D-B-L." Both are steels that really take the "hack" out of hack saw blades. That's why blades made of these Ingersoll steels are being used today in so many shops and plants all over America.

gersoll "18-4-1" Steel is again available to lade makers. Where "D-B-L Blades" are pre-erred, remember only Ingersoll has had a 6-year record in the ccessful production of this steel which insures blades with ugh cutting edges, high impact resistance and relative freedom om decarburization.

INGERSOLL "18-4-1"

INGERSOLL D-B-L*

INGERSOLL *Steel Division*

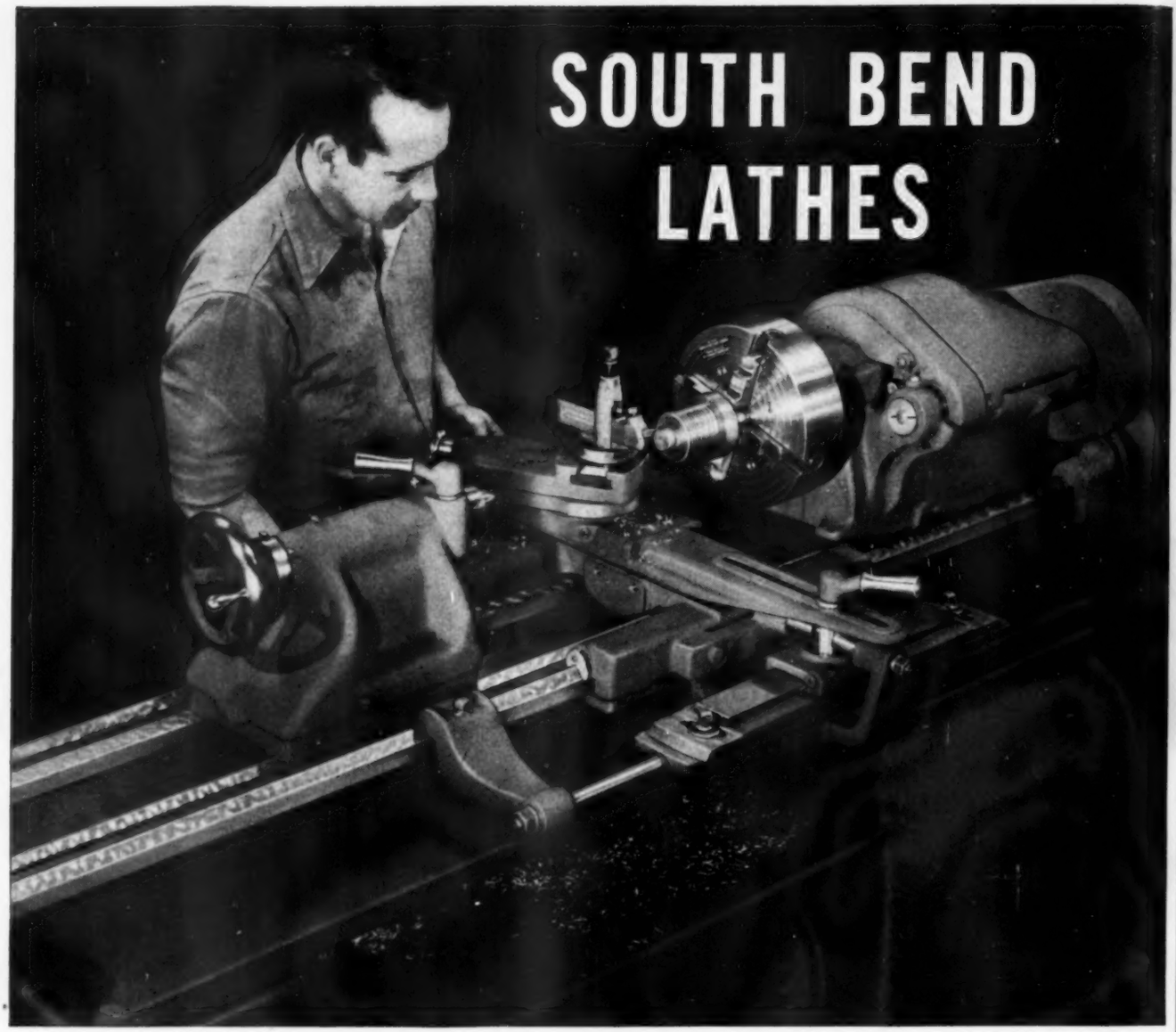
Borg-Warner Corporation • New Castle, Indiana

Plants: New Castle, Indiana • Chicago, Illinois • Kalamazoo, Michigan

*Furnished in the original D-B-L Regular, -"5-4" and D-B-L 2, -"6-5".

INGERSOLL *Special Steels for Special Uses*

Alloy Steels	Tillago Steels	Knife Steels	Stainless Steels and Saw Steels, including "18-4-1" and Molybdenum and D-B-L Hack Saw Steels
Armor Plate	Soft Center Steels	TEM-CROSS Steel	
Clutch Plate Steels	Shovel Steels	IngAclad (Stainless-Clad Steel)	



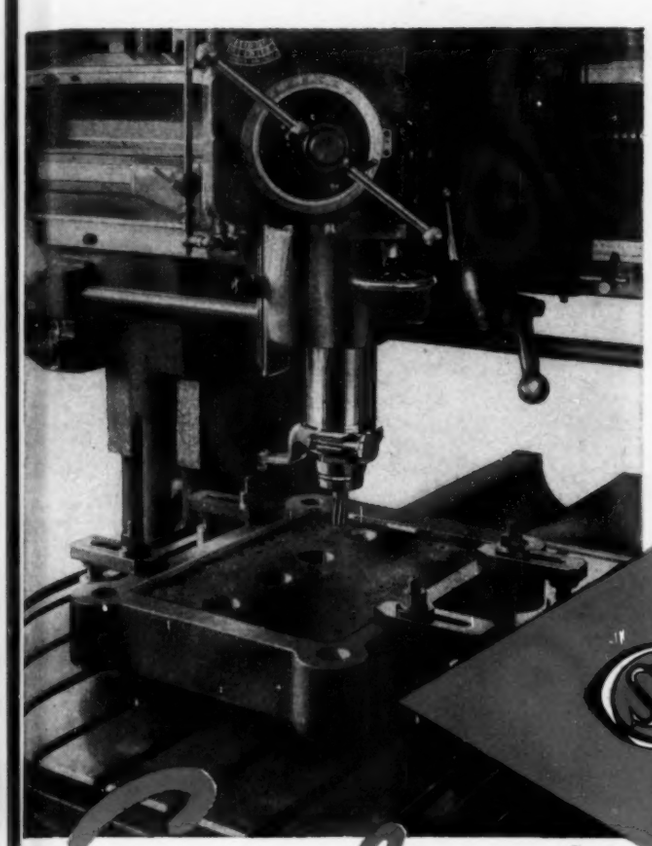
Designed for TODAY'S Needs!

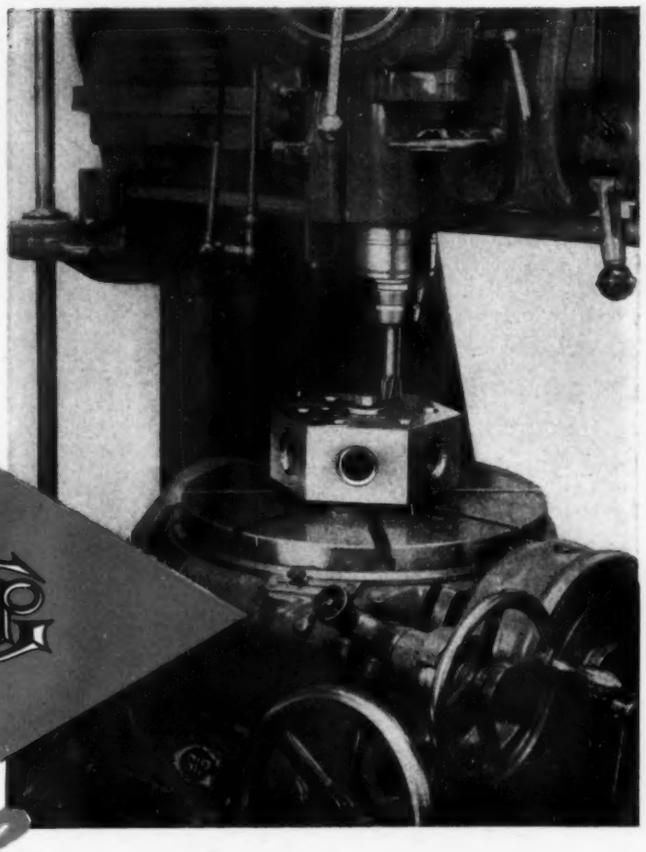
South Bend Precision Lathes are designed and built to meet the exacting needs of today's industries. Their accuracy, and ability to handle a wide variety of operations, raise standards of quality in the toolroom, speed tooling, keep costs to a minimum. These same features—plus speed, ease of operation, and dependability—raise quality levels in the manufacturing plant, step up the flow of production, lower costs by reducing the amount of "machine scrap," and, in some instances, by eliminating the need for one or more finishing operations.

Made with 9", 10", 13", 14½", and 16" swings, with collet capacities up to 1", and with bed lengths to 12', there is a South Bend Lathe that will meet your most exacting requirements. 16" x 6' Toolroom Lathe, shown above, is available with bed lengths to 12'. Write today for complete, illustrated Catalog 100-D which contains full, detailed specifications.

TELESCOPIC TAPER ATTACHMENT
For 10", 13", 14-1/2", and 16" South Bend Lathes
Write for Catalog 77 which illustrates and describes the complete line of South Bend Lathe attachments and accessories. Mailed without obligation.

SOUTH BEND LATHE WORKS
419 EAST MADISON STREET • • SOUTH BEND 22, INDIANA
LATHE BUILDERS SINCE 1906





Exclusive

. . . PRECISION *and* VERSATILITY!

These two precision operations illustrate the extensive range of applications of the SIP HYDROPTIC-B, made possible by its exclusive adaptability for milling as well as jig boring and drilling. On the base plate for a piercing die, the milling as well as all the boring operations are performed by the HYDROPTIC-B Jig Boring and Milling Machine. On the second job, all six sides as well as the top surface of the turret head are machined in a single set-up, using the HYDROPTIC-B equipped with the SIP tiltable indexing table.

Combining hydraulic feeds for versatility and optical settings for the highest precision, the SIP HYDROPTIC-B Jig Boring and Milling Machine will answer your most exacting needs for toolroom and production operations.

SIP JIG BORERS
RANGE OF TABLE SIZES

No. 2C	18"x10¾"
No. 2H	27½"x12½"
No. 3K	20½"x15"
No. 4G	27½"x23⅝"
Hydroptic B (illustrated)	39½"x32"

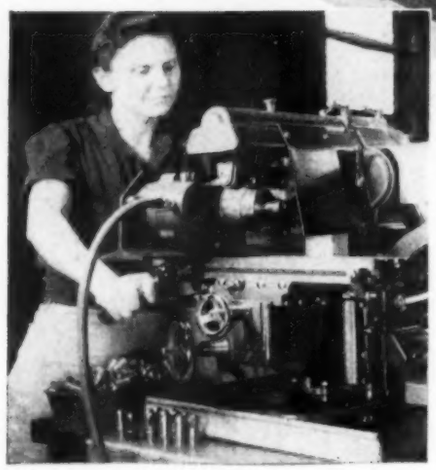
HIGH PRECISION MACHINE TOOLS AND MEASURING INSTRUMENTS

COSA CORPORATION

COSA

CHRYSLER BUILDING
New York 17, New York

Atlas MILLER + INGENUITY RAISES PRODUCTION 43%



An Atlas miller equipped with Redmer Air Chucks at work in the Redmer plant in Chicago. The ingenious adaption of air chucks and drive freed operator's hands for loading and unloading . . . increased output 43%!

PROMPT DELIVERY!

Increased production facilities are bringing us back to normal on delivery schedules. Ask your Atlas distributor for current information.

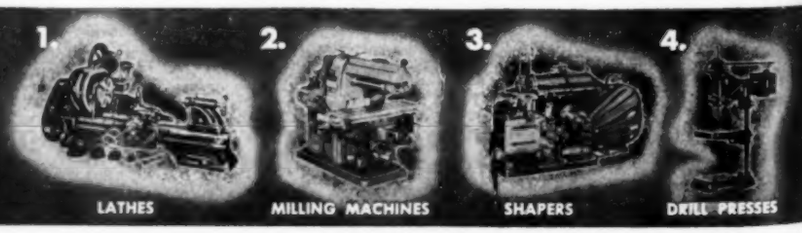
UNIQUE ADAPTATION SPEEDS MILLING OF PRECISION PARTS

Production zoomed 43% when Redmer Air Devices Corporation, Chicago, coupled their own air chucks with precise Atlas Bench Millers. The steady grip of the air chuck and the constant, steady speed of the air drive, teamed with the in-built accuracy of the Atlas milling machine, resulted in a steady flow of perfect precision parts. No rejects . . . no scrap!

Special Atlas adaptations are found in hundreds of plants. In practically every case they have made substantial savings in machine tool costs . . . increased precision production. To capitalize similar opportunities for engineering ingenuity in your plant, write today for the latest Atlas catalog.

ATLAS PRESS COMPANY
104 N. PITCHER ST., KALAMAZOO 13, MICH.

Atlas 4 TOOL TEAM FOR SMALL-PART MACHINING



SAVE

The No. 8 showing new Wells Wet Cutting System – an economical accessory available for all No. 8 Wells Saws.

✓time

If it's *metal cutting,* move the handy Wells saw to the job. It's portable . . . self-contained . . . versatile! Save the time lost in moving material in and out of metal cutting rooms. Get jobs finished quickly, indoors or out. Reduce shop congestion.

✓manpower

Wells Metal Cutting Band Saws are easy to use . . . quick to set up . . . require little supervision. With a Wells, one man can handle many miscellaneous cutting jobs along with other work.

✓material

The Wells saw does good work . . . cuts close . . . removes minimum stock. Because operation is simple, any shop man can use it safely and efficiently with minimum waste.

✓money

No large capital investment is required for a Wells saw, the machine with many uses. Power operating costs are low. It occupies little floor space and is a profitable utility tool for countless shops. For complete information, send for interesting descriptive literature or see your local Wells distributor.

Wells SAWS
THE SIGN OF SERVICE

Wells

METAL CUTTING BAND SAWS

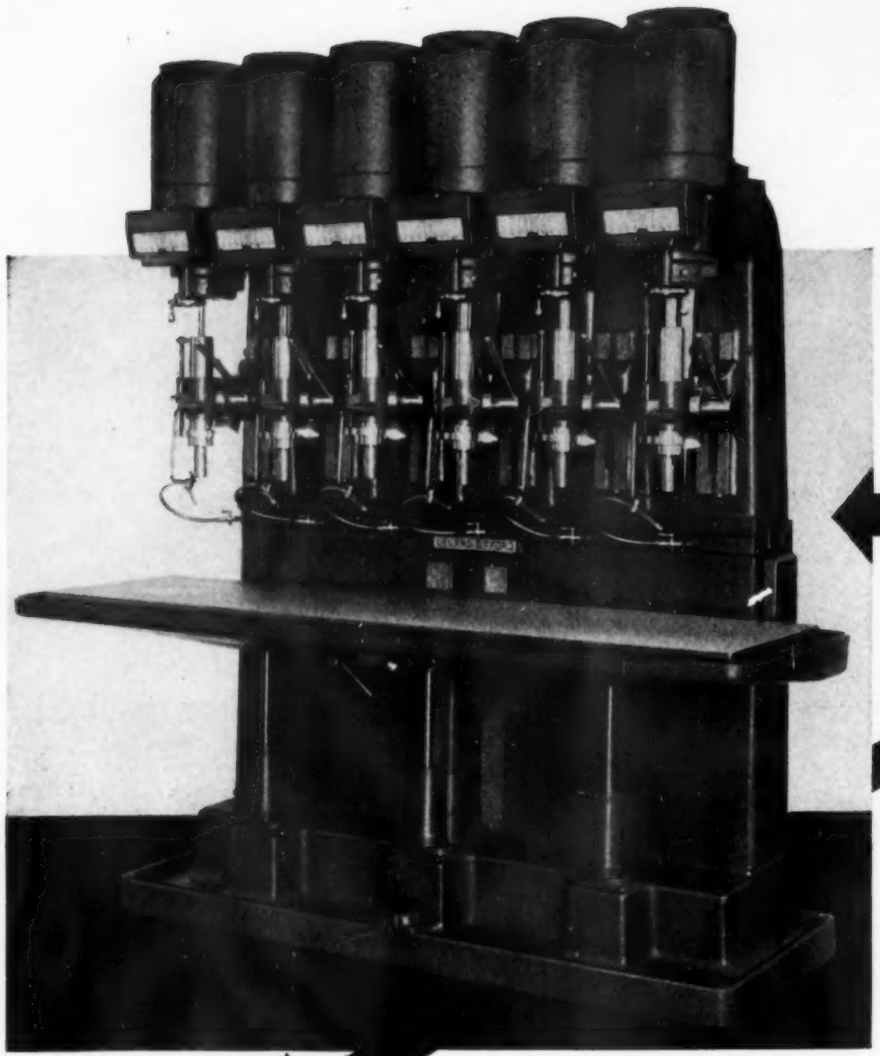
Specifications

CAPACITY:	
Rectangular	8″ x 16″
Rectangular (special guides)	5″ x 24″
Rounds	8″ O. D.
MOTOR	½ H.P., A.C. or D.C.
SPEEDS	Selective 60, 90, 130 feet per minute
WEIGHT	Approximately 665 pounds

WELLS MANUFACTURING CORPORATION

505 Roosevelt Road, Three Rivers, Mich.

Products by Wells are Practical



LELAND GIFFORD

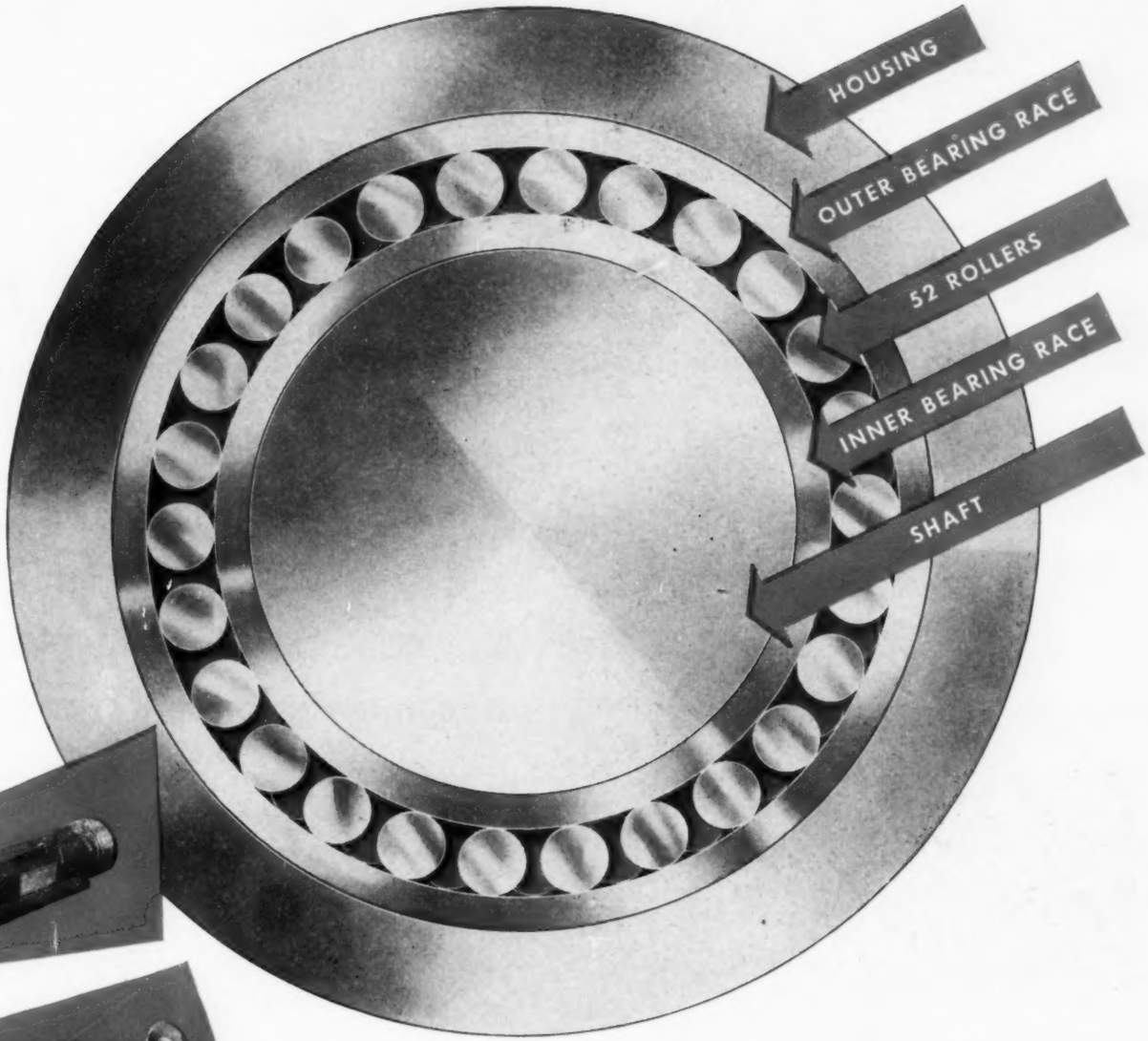
NO. 2 LMS MOTOR SPINDLE DRILLING MACHINES

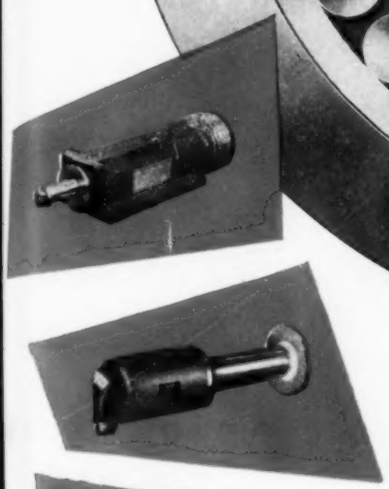
Have

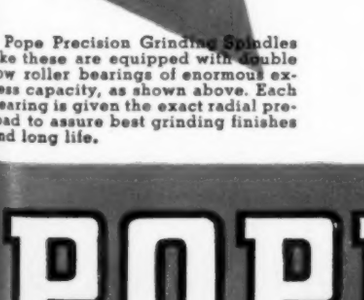
1. *Totally enclosed, Fan Cooled, Ball Bearing Motors.*
2. *Four or eight Spindle Speeds — Instantly Available.*
3. *Built-in Work Lights.*
4. *Preloaded Ball Bearing Spindles.*
5. *Ratchet type Feed Levers.*
6. *Box type, surface plate ribbed Tables.*
7. *Lots of Rigidity.*

LELAND-GIFFORD

WORCESTER 1, MASSACHUSETTS, U. S. A.







Pope Precision Grinding Spindles like these are equipped with double row roller bearings of enormous excess capacity, as shown above. Each bearing is given the exact radial preload to assure best grinding finishes and long life.

SEE FOR YOURSELF

Why POPE PRECISION SPINDLES *have* AMPLE ABILITY *to stand up under hard work*

Note the practically CONTINUOUS BEARING SUPPORT for the shaft provided by the SKF Double Row Roller Bearing. This insures the smooth running necessary for FINE FINISHES on ground surfaces.

And remember — these are ROLLERS you are looking at. For *rugged ability* to *carry loads easily* and *smoothly* for *long periods, there's nothing like a roller.*

No. 39

POPE

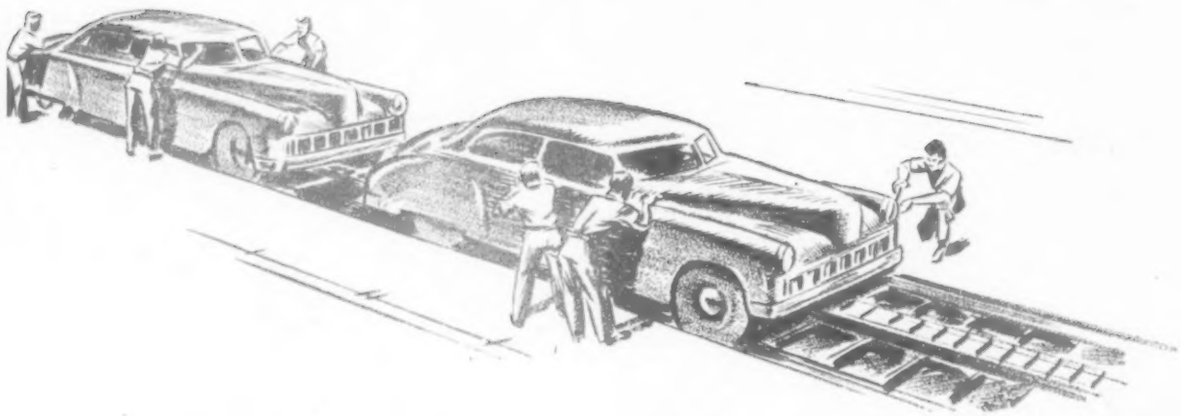
POPE MACHINERY CORPORATION

ESTABLISHED 1920

261 RIVER STREET • HAVERHILL, MASSACHUSETTS

BUILDERS OF PRECISION SPINDLES

IN YOUR INDUSTRY...



Leadership BUILDS ON *Craftsmanship*

For more than four decades, in all branches of the metal-working industry—and more recently in the plastics field—WINTER Taps have helped to make craftsmanship possible. The closer threading tolerances, cleaner threads, longer service between grinds, and extra tap life obtained from WINTER Taps are a natural result of Winter Brothers untiring research and constant laboratory testing. For greatest production at lowest tap cost, specify WINTER Taps.

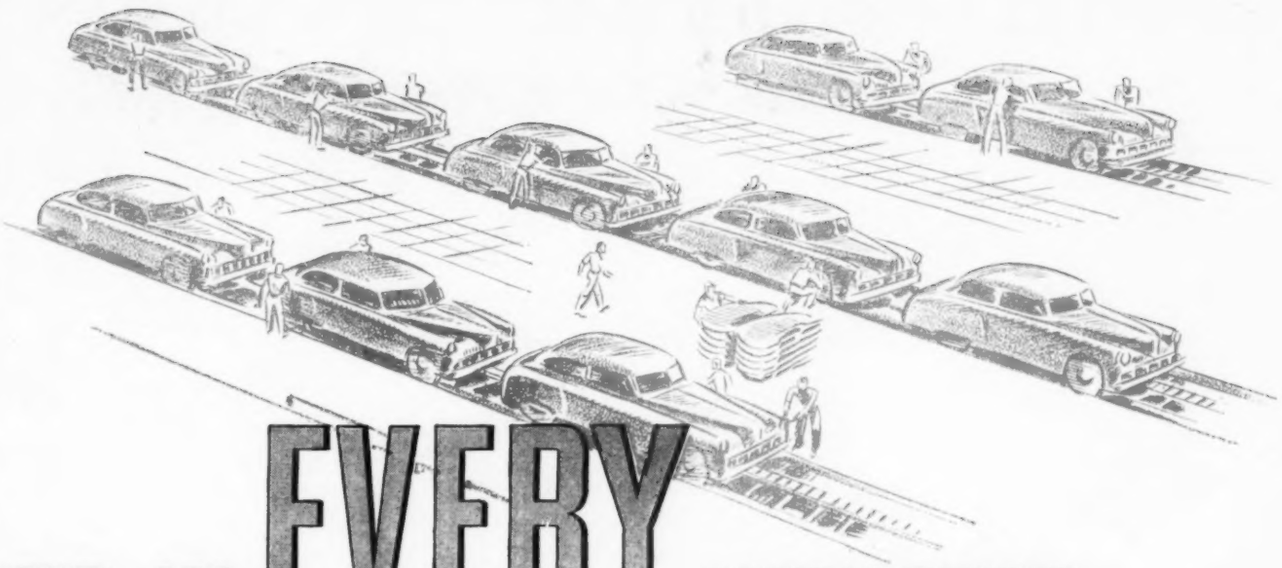
Craftsmanship of the highest order always has been employed in the manufacture of WINTER Taps.

Your local distributor carries a complete stock of WINTER Taps on his shelves—as close to your tapping problems as the phone on your desk.

Winter Brothers COMPANY

WRENTHAM, MASS. and ROCHESTER, MICH. • **Distributors in Principal Cities**

A Division of the National Twist Drill and Tool Company • Branch Stores: San Francisco, Chicago, Detroit



AND IN EVERY INDUSTRY

You get top quality both in your cutting tools and in the work they do when you specify NATIONAL. NATIONAL Counterbores (shown below) are the result of 43 years of specialized experience in the design and manufacture of Rotary Metal-Cutting Tools. For the best in high speed steel and carbon steel Twist Drills and Reamers, high speed steel Milling Cutters, End Mills, Hobs, Counterbores, and Special Tools—always ask for NATIONAL.

Craftsmanship INSURES *Quality*

The skill and facilities to make NATIONAL Tools the best you can buy are supplied at NATIONAL'S great new plant in Rochester, Michigan.

Leading distributors everywhere offer complete stocks of NATIONAL Cutting Tools and factory-trained men to serve you. Call them for cutting tools or any staple industrial product.

NATIONAL TWIST DRILL AND TOOL COMPANY

ROCHESTER, MICHIGAN, U.S.A. Distributors in Principal Cities

Factory Branches: New York • Chicago • Detroit • Cleveland • San Francisco

A HIGHLY DEVELOPED LINE...

Avey

MA 8—Eight speeds. 1200 to 12,000 R.P.M. Small work up to ⅜". Built-in motor. Bench and column types. 1 to 6 spindles.

Type B—No. 1, No. 2, No. 3 sizes. Hand feed drilling units. Hand feed tapping units. Power feed drilling units.

ONLY years of steady development can evolve the drilling equipment that is found in the Avey Line of Sensitive Drilling Machines.

The advances required in machining methods caused by the demands for greater output, necessitated more efficient drilling equipment. Avey Drilling Machines have steadily led the field.

Avey High Speed Sensitive Drilling Machines are built-in types and sizes to cope with varied needs. They are designed in capacities from the smallest drill gauge size to approximately 1¼ inches.

Being ball bearing throughout, they rate the highest speeds without vibration. This feature insures maintained accuracy.

The Avey Catolog details the line of Avey Drilling Machines and Drilling Machine Accessories.

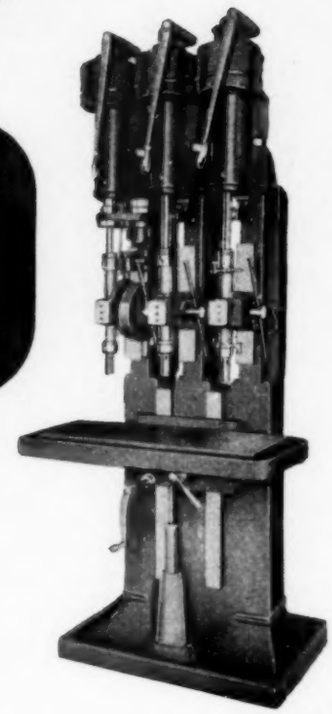
Avey Engineers will come to your aid in solving new and different drilling problems.

•

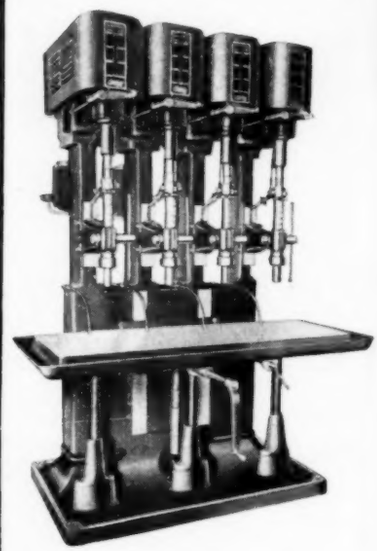
Individual Motors for each Spindle.

Single and Multiple Spindles.

AVEY
DRILLING MACHINE CO.
CINCINNATI · OHIO



MA 6—Six speeds. No. 2 and No. 3 sizes. Built-in motors.



Belted quick speed change machine. No. 2 size. Four speeds. Standard frame motors.

Avey DRILLING MACHINES
CINCINNATI · OHIO

Who decides what cutting oils to use in your plant?

DOES EVERYONE TRY to duck the tough job of selecting cutting oils or coolants when a new job comes up, or when new metals are introduced in a cutting, grinding, or forming operation? It's easy to understand why. The wrong cutting oil can upset time studies, cost estimates, and production rates throughout the plant. These are ample reasons why the right cutting oil should be selected when a new job is started.

There's one man who won't duck this job. He's a Standard Cutting Oil Specialist. If your plant is located in the Midwest, you'll find one of these specialists at the nearest Standard Oil office. He's easy to reach and ready to study your cutting oil needs. He'll analyze just one job, or the operation of your whole plant, whichever you wish.

There are two sound reasons why he can help you. First, he has complete knowledge of products developed by Standard Oil for practically all machining operations. Second, he has had experience in applying these products in many other plants. You'll find Standard's Cutting Oil Service the real short cut to your cutting oil answers. Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

Standard's CUTTING OIL SERVICE

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

TRAVELLING TUBE CUTOFF

Gets 4 times the life from these $600 turntable bearings!

Problem: Ball bearings and races in this turntable became rusted and pitted after two years' operation, due to exposure to steam, hot water, and an acetic acid and glucose mixture. It was necessary to remove and clean the bearings every 3 months and to replace the set every two years, at a cost of $600.

Solution: A Standard Oil Lubrication Engineer recommended Calumet Viscous Lubricant 5x—an extremely adhesive, water- and heat-resistant lubricant used extensively on open gears under adverse operating conditions.

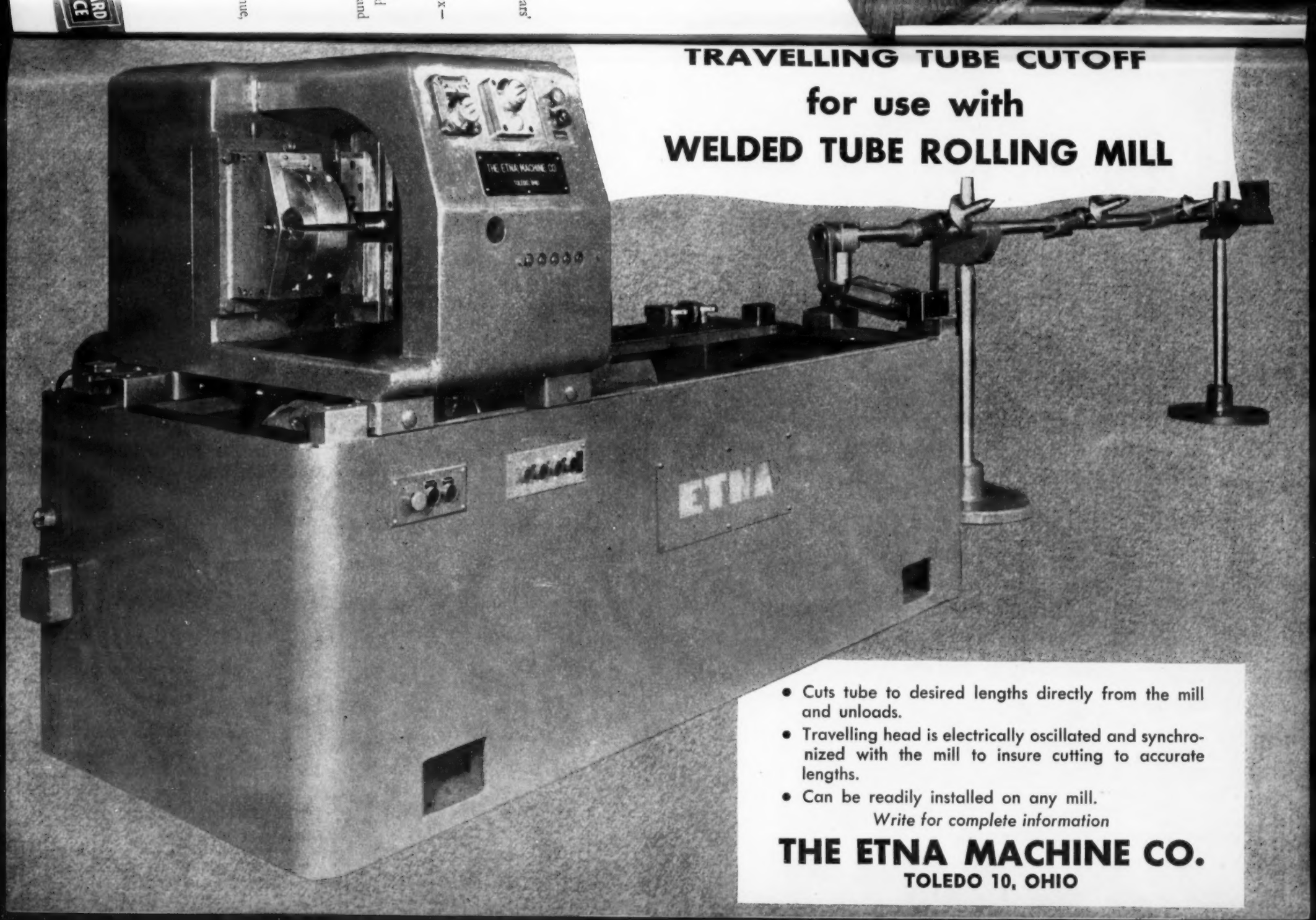
Result: Calumet Viscous Lubricant stopped the rusting of bearings and races, and eliminated the frequent cleaning. Turntable operates freely at all times, and bearing sets now last 4 to 5 times longer. This improved operation means a substantial saving on maintenance of the six turntables in the plant.

with

CALUMET
Viscous Lubricant

Have you a troublesome or costly lubricating problem? Call in a Standard Oil Lubrication Engineer. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE



TRAVELLING TUBE CUTOFF
for use with
WELDED TUBE ROLLING MILL

- Cuts tube to desired lengths directly from the mill and unloads.
- Travelling head is electrically oscillated and synchronized with the mill to insure cutting to accurate lengths.
- Can be readily installed on any mill.

Write for complete information

THE ETNA MACHINE CO.
TOLEDO 10, OHIO

NEW! The OLIVER HEAVY DUTY ACE

Built Specially for TUNGSTEN CARBIDE

The machine shown is the new Oliver Heavy Duty ACE Tool and Cutter Grinder. It is an adaptation of the standard model intended for the heavier work of gumming and gashing cutters and for use in grinding cutters tipped with Tungsten-Carbide. It retains all the desirable qualities of the standard machine, but is equipped with a much heavier ram, larger ram bearing, a heavier motor and a heavier spindle. The frame has also been increased in weight and everything done to insure vibrationless grinding.

The same type of fixtures are used on this machine as on the standard ACE. In addition the Oliver ACE Tool and Cutter Grinder has such exclusive features as:

A fixed diamond which compensates for the wear of the wheel

A means for grinding eccentric relief on milling cutters and reamers

Correct clearance obtained by direct reading—no computations or tables

Grinding on the top tooth of the cutter in full view of the operator

Comfortable standing position of operator

No special attachments needed for grinding all regular (and many special) milling cutters

For the grinding of Tungsten Carbide in its many forms

The New Oliver ACE Tool and Cutter Grinder will prove a most efficient piece of equipment.

Send for New Illustrated Catalog.

IMPROVE YOUR TOOLROOM IT'S THE BACKBONE OF PRODUCTION

OLIVER OF ADRIAN

AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL POINT THINNERS—TEMPLATE TOOL GRINDERS—FACE MILL GRINDERS—DIEMAKING MACHINES

OLIVER INSTRUMENT CO.
1414 E. Maumee St. Adrian, Mich.

If you have a SPECIAL PROBLEM

in any of these operations, where precision work is demanded and where greater production at man-hour savings is paramount—

• BORING—rough, semi-finish and finish • MILLING (special types) • STRAIGHT LINE DRILLING • UNIVERSAL ADJUSTABLE SPINDLE DRILLING • HONING • TAPPING • REAMING • COUNTERBORING • VERTICAL AND WAY-TYPE EQUIPMENT

then a Moline Multiple Spindle Specially Designed machine tool is your answer. Moline tools are ruggedly built and engineered to fit your PARTICULAR requirements, they're made to last for years, they're easy to change over to other jobs, they do better work at less cost and stand up to it longer.

For YOUR special problem, go "HOLE-HOG," write us for any information you may need.

MOLINE TOOL CO. HOLE-HOG MOLINE, ILLINOIS

MOLINE TOOL CO.
100 20th Street Moline, Illinois

DRILL 6 HOLES AT ONE STROKE!—ADJUSTABLE FOR ANY PATTERN

Multiply the production of every drill press . . . make your single spindle tools do the work of 6 with the Multi-Drill attachment. Six spindles are quickly and easily positioned to ***any*** hole pattern by simple adjustments of the locating arms. Fits any drill press. Standard Multi-Drill Spindles using 1/4" to 17/64" drill size handle any hole pattern on or within 5" circles—1 1/16" minimum centers.

SAVE:
- **Drilling time**
- **Set-up time**
- **Equipment investment**
- **Floor space**

NOTE: Special spindles are available to permit use of drills 1/16" to 3/16" diameter with corresponding minimum centers of 1/2" and 7/8".

Write for catalog sheets and complete details

COMMANDER MFG. CO.
4229 W. Kinzie Street
Chicago 24,
Illinois

MACHINE OF THE MONTH

REPARED BY THE SENECA FALLS MACHINE CO. **"THE Lo-swing PEOPLE"** SENECA FALLS, NEW YORK

WIDE-RANGE ADAPTABILITY AND UNUSUAL TOOLING POSSIBILITIES OF THE *Model* **LR** *Lo-swing* DEMONSTRATED ON TRANSMISSION GEAR JOB

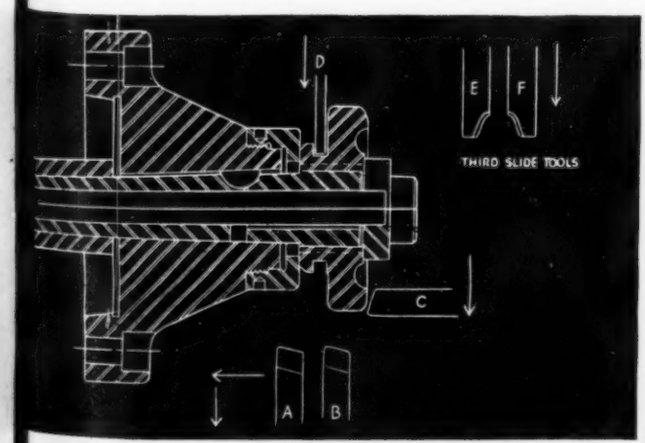
ROBLEM: To rough and finish turn O. D., face, roove and round edges of a transmission gear in a ingle operation.

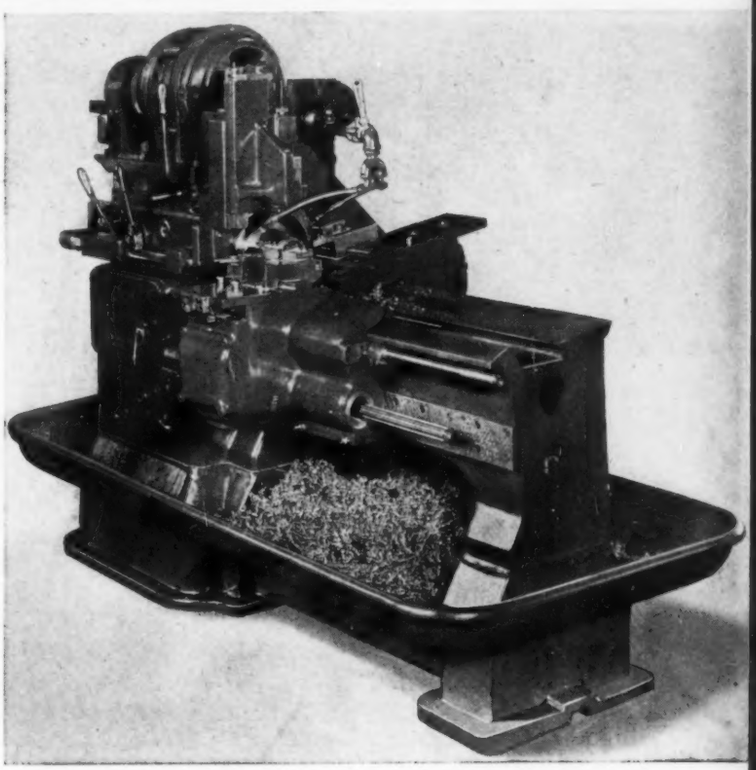
OLUTION: The work comes to the machine with e bore and back face finished. It is then placed on stub arbor and held by a draw bar and a "C" asher. As the automatic cycle begins, the front carriage moves longitudinally and tools "A" and "B" ee tool layout below) rough and finish turn the O. . of the gear. As the front slide moves out, tool "C" aces the outside surface. Simultaneously with the bove operations, tool "D" on the back squaring ttachment machines the groove, and tools "E" and F", mounted on the vertical third slide, form the orners of the gear body.

ll tools are tipped with carbide, assuring maximum roduction at high spindle speeds and a first class nish. Simplicity of tooling is also an important eature where many different sizes of gear blanks re to be machined.

nother important feature of this lathe is the Simlified Change-over Mechanism which makes changng from one job to another as simple as setting a ool.

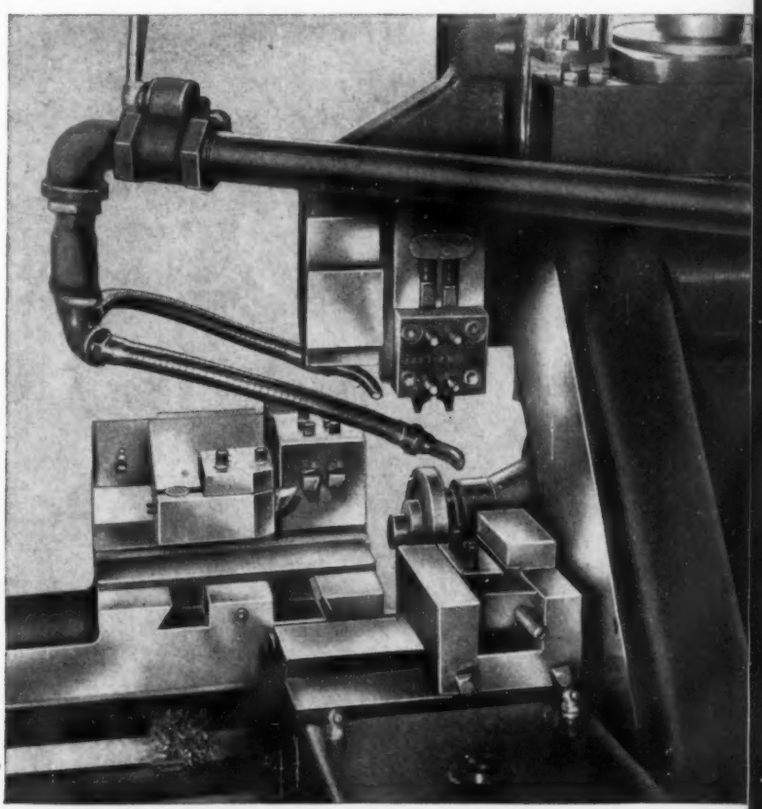
atalogs and full information furnished on request.





Above: Model LR Lo-swing Lathe equipped with Third Arm.

Below: Close-up view from rear of machine showing tooling for the gear job described.



LATHE NEWS from SENECA FALLS

Proof of LOWER PRODUCTION COSTS

with REED Triple-Die *Precision Thread Rolling!*

1200 THREADS an hour

Part: ROTOR SHAFT—10" long
Thread: 1/4"—28 NF-3 (1/4" long)
Material: STEEL—SAE 3140

Rolled on the **REED Cylindrical-Die THREAD ROLLER** Model A22

For complete specifications, write for Bulletin A22-1.

Prove it to your own satisfaction! Send us specifications of your work and let us roll samples. We will furnish production estimates and equipment costs.

REED A22 *for*
THREADING • KNURLING • FORMING • BURNISHING • SERRATING

REED ROLLED THREAD DIE CO.
Formerly ROLLED THREAD DIE CO. and REED SMALL TOOL WORKS
237 Chandler Street, Worcester 2, Mass., U. S. A.
Mfrs. of Knurls – Thread Rolling Dies – Thread Rolling Machines

KEYSEATING
The Modern Way

Illustration shows typical set-up for cutting taper keyways with table tilted.

Machines are made in three sizes for keyways 1/16" to 1¼" in width.

Great simplicity and ease of operation of Davis Keyseaters assure the user of accurate, time saving work.

Let our engineer study your keyseating problems.

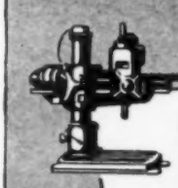
DAVIS KEYSEATER COMPANY
403 EXCHANGE ST. ROCHESTER 8, N. Y.

GEAR CUTTING MACHINES

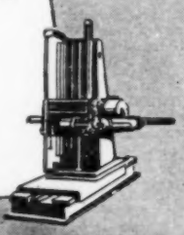
New Design
New Features
New Advantages

NEWARK GEAR CUTTING MACHINE CO.
69 Prospect Street, NEWARK 5, NEW JERSEY
FRANK E. EBERHARDT, *President*

GILBERT

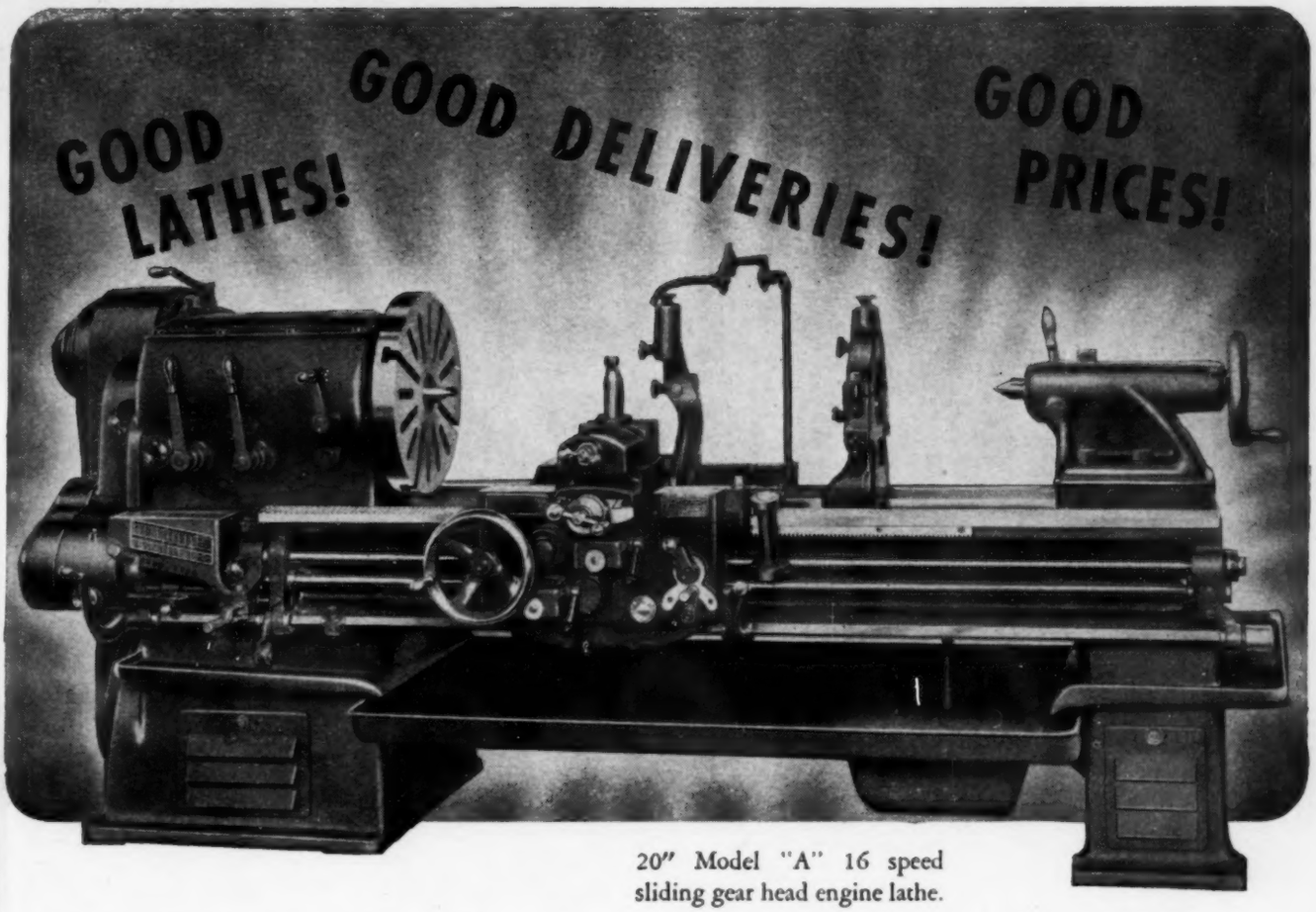


PRODUCTION SPEEDING RADIAL DRILLS AND HORIZONTAL DRILLING, BORING AND MILLING MACHINES



DETAILS ON REQUEST

THE CINCINNATI GILBERT MACHINE TOOL CO.
CINCINNATI, OHIO



20" Model "A" 16 speed sliding gear head engine lathe.

REED-PRENTICE LATHES are the result of the selection of the finest materials procurable, fabricated on the most modern and efficient machinery in the machine tool field. Bed vees and ways are held to a tolerance of .0005 straight and parallel. Feed and lead screws as well as all gearing are cut within our plant on modern equipment, supervised to maintain the most rigid tolerances. All work is done by skilled craftsmen with many years of experience. You can count on smooth, accurate performance with the assurance of long, dependable, trouble-free service.

DELIVERY. Immediate delivery can be made on all types of Reed-Prentice engine and toolroom lathes, 14", 16" and 20".

PRICES. Base prices exclusive of electrical equipment remain at or below price ceilings established June 20, 1941. The ability to retain or lower these price levels is the result of our efficient manufacturing processes.

Whatever your requirements within the range of swings and bed length, it will pay you to investigate the Reed-Prentice line.

Reed-Prentice Corporation
Dept. A
Worcester 4, Massachusetts

Please send complete literature with specifications and prices of toolroom and engine lathes.

NAME.....

TITLE.....

COMPANY.....

ADDRESS.....

MACHINE TOOLS
REED-PRENTICE CORP.
WORCESTER MASS., U.S.A.

NEW YORK OFFICE:
75 West St., New York 6, N. Y.

CLEVELAND OFFICE:
1213 W. 3rd St., Cleveland 13, Ohio

OUT OUR WAY

THAT'S TH' BIGGEST STRAIN OF BEIN' TH' HEAD OF ANYTHING! TH' ONES WHO CAN'T GET ALONG WITHOUT YOU ARE TOO QUICK WITH TH' PULMOTOR, AN' TH' ONES THAT CAN'T GET ALONG WITH YOU ARE TOO QUICK WITH TH' STRETCHER!
YEH--BUT IT WAS A TERRIBLE SHOCK! THEY JUST TOLD HIM THAT WE'RE OUTA SOL-SPEEDI-DRI AND THEY FERGOT TO ORDER SOME!
T. M. REG. U. S. PAT. OFF. COPR. 1946 BY NEA SERVICE, INC.
A CRYING SHAME
J.R.WILLIAMS

A crying matter? Sure . . . for when floors become oil- and grease-soaked . . . when their surfaces become ice-slick and dangerous . . . it's *time* to cry for SOL-SPEEDI-DRI, the oil-thirsty absorbent!

SOL-SPEEDI-DRI is a white, granular substance that soaks-up oil- and grease-deposits as a sponge soaks-up water. Just spread it around . . . and immediately, you've got a magic carpet of safety underfoot . . . no slipping or falling with SOL-SPEEDI-DRI on the job. Sweep it up with an ordinary, stiff broom . . . and your floors are bright and safe.

SOL-SPEEDI-DRI puts economy in any industrial plant on a firm foundation. Accident rates go down . . . productive time goes up . . . manpower is saved for other jobs. It works while you work . . . in safety!

SUPPLIERS: *East*—Safety & Maintenance Co., Inc., No. 1 Wall St., New York 5, N. Y.
South, Midwest & West Coast—Waverly Petroleum Products Co., Drexel Bldg., Philadelphia 6, Pa.

Get the full story of SOL-SPEEDI-DRI today. Just write "SOL-SPEEDI-DRI" on your letterhead or business card for complete details and a free, generous sample.

KEEP IT LUBRICATED

The finest equipment in the world won't stand up long without proper lubrication. The problem of delivering and maintaining lubricants is one of the most important that production men have to contend with.

American Machinist's Special Report on "How to Deliver and Maintain Lubricants" gives the full story on this very important function as it relates to Metalworking. It appeared in our July 18, 1946 issue. Over 100 technically accurate illustrations show graphically the how and why of lubricating devices. Pressure lubrication, automatic systems, air lubricators, lubrication pumps, and lube-oil maintenance are thoroughly covered. Formulas, factors, and tables of size are given.

If you would like reprints of this Special Report, the most thorough survey on this subject ever made in such concise form, *write*

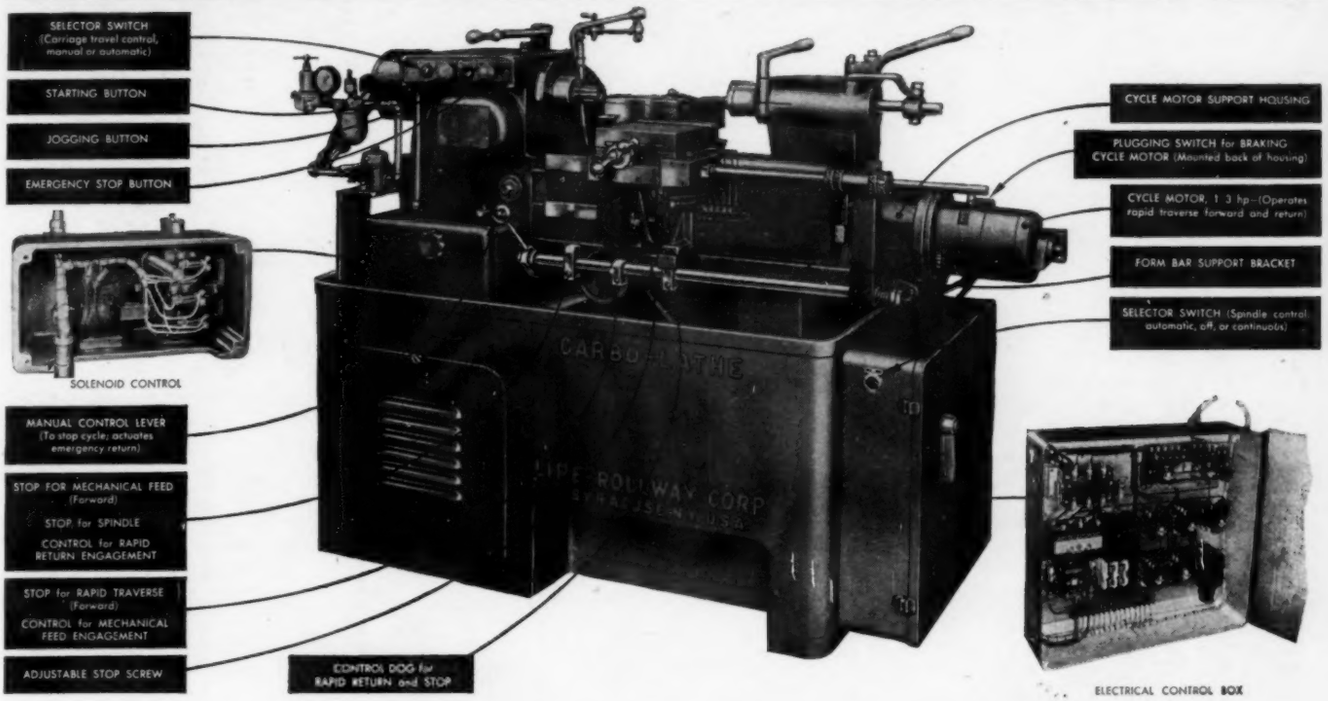
READER SERVICE

American Machinist

330 West 42 Street
New York 18, N. Y.

Please enclose 10¢ per copy for costs of handling and mailing.

Fast, Simple Operation...
WITH THE PUSH OF A BUTTON!


SELECTOR SWITCH (Carriage travel control, manual or automatic)
STARTING BUTTON
JOGGING BUTTON
EMERGENCY STOP BUTTON
SOLENOID CONTROL
MANUAL CONTROL LEVER (To stop cycle; actuates emergency return)
STOP for MECHANICAL FEED (Forward)
STOP for SPINDLE
CONTROL for RAPID RETURN ENGAGEMENT
STOP for RAPID TRAVERSE (Forward)
CONTROL for MECHANICAL FEED ENGAGEMENT
ADJUSTABLE STOP SCREW
CONTROL DOG for RAPID RETURN and STOP
CYCLE MOTOR SUPPORT HOUSING
PLUGGING SWITCH for BRAKING CYCLE MOTOR (Mounted back of housing)
CYCLE MOTOR, 1 3 hp.—(Operates rapid traverse forward and return)
FORM BAR SUPPORT BRACKET
SELECTOR SWITCH (Spindle control: automatic, off, or continuous)
ELECTRICAL CONTROL BOX

The New Electrical Control for Complete Cycle on

LIPE *Carbo-Lathes*

INCREASES PRODUCTION...CUTS COSTS...REDUCES FATIGUE

Just Push the Starting Button, and...

- The spindle starts, the carriage rapidly moves up to cutting position, and the mechanical feed automatically engages.
- At the end of feed cut, mechanical feed disengages and the carriage stops for predetermined length of time to allow tools to clear themselves. Then spindle stops and carriage rapidly returns to loading position ready for next operation.
- With the manual control, the operator can disengage and reengage feed, stop spindle, and return carriage at any point.
- The selector switch permits continuous operation of the spindle. A push button starts feed at beginning of cycle.

Note: Lipe Carbo-Lathes Sold with or without Complete Cycle Attachment.

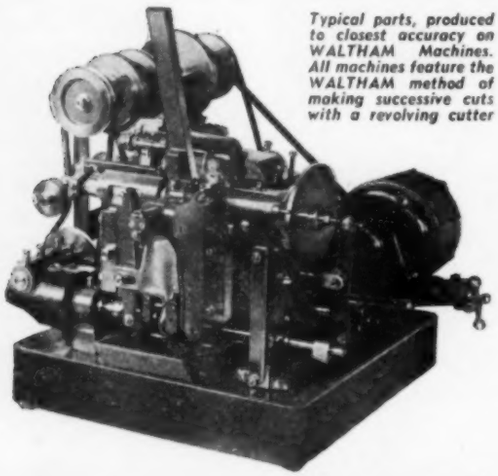
Bring Your Lipe Carbo-Lathes Up to Date . . .

Lipe automatic complete cycle attachment may be applied to any Lipe Carbo-Lathe bearing a serial number of 200 or greater, and may be used with either plain or taper turning type front carriage. See your Lipe distributor for full details.

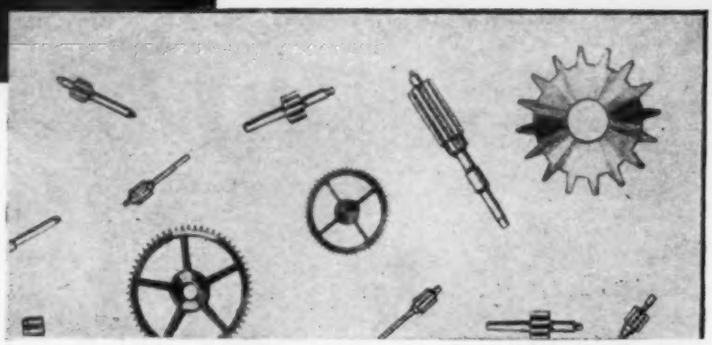
Lipe-ROLLWAY CORPORATION • SYRACUSE 1, N. Y., U.S.A.
Cable Address: LIPEGEAR

WALTHAM
PINION & GEAR CUTTING MACHINES

for precision production of fine pitch mechanisms



Typical parts, produced to closest accuracy on WALTHAM Machines. All machines feature the WALTHAM method of making successive cuts with a revolving cutter



Single-Cut Pinion Machines This machine employs one cutter. Blank is positioned and machine started by hand, all other movements being automatic.

Multiple-Cut Pinion Machines Two or three cutters on arbor of cutter spindle make successive cuts. Machine stops on completion of last cut.

Magazine-Fed Pinion Machines Provides continuous production of one kind of pinion. Magazine is loaded and all other operations including cutting and ejecting are automatic and continuous.

Gear Cutting Machines Single and Multiple cut machines equipped with special cutter swing provide the means of cutting teeth on gears up to 1½" pitch diameter and in a stack ¾" to 1" long.

Write for literature giving detailed specifications

WALTHAM MACHINE WORKS
WALTHAM, MASS.

WALTHAM
TRADE MARK REGISTERED U.S. PAT. OFF.

Available for IMMEDIATE DELIVERY

HUB POWER PRESS
With Motor Drives
for speed, accuracy and economy

These convenient, high speed, power presses will handle materials with ease and convenience. Assures high production of parts at lowest cost.

Made in 4½, 6 and 15 Ton Capacities.

Send for Circulars and Prices.

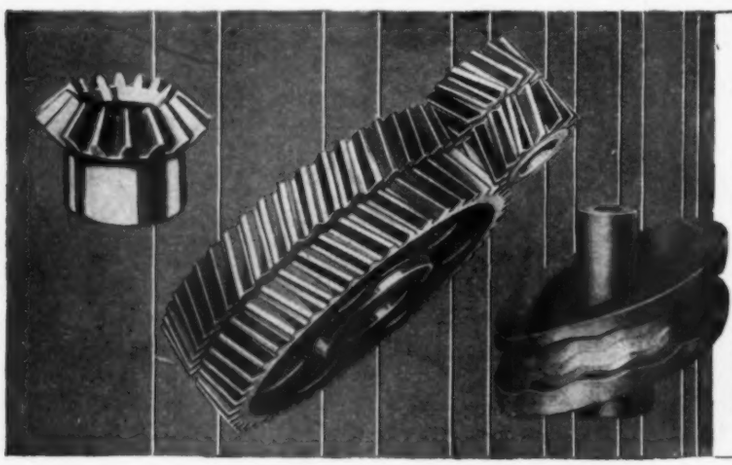
WILLIAM F. BREWER MACHINE CO.
75 LAUREL STREET **HARTFORD 6, CONN.**

ABRASIVE
ACCURACY BOOSTS PRODUCTION

No. IG	INTERNAL GRINDER	**No. 34**	VERTICAL SPINDLE SURFACE GRINDER
No. 1½	HAND FEED SURFACE GRINDER	**No. 3B**	AUTOMATIC FEED SURFACE GRINDER

Look for Our Full Page Advertisements

ABRASIVE MACHINE TOOL CO.
EAST PROVIDENCE 14, RHODE ISLAND



GET YOUR QUOTATION *from* "HARTFORD"

GEARS of every description cut to order

GEAR, CAM and THREAD grinding

AERONAUTICAL PARTS on contract basis

Send blue prints or samples for estimate. Accuracy of work guaranteed to your specifications.

THE HARTFORD SPECIAL MACHINERY COMPANY
HARTFORD **CONNECTICUT**

FAST INSPECTION To Split "Tenth" Accuracy!

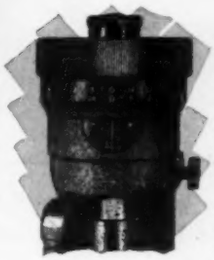
Pla-Chek Gage set up for checking location of holes in Multiple Drill-Head Casting used on an Excello Special Machine

Supplies any Dimension to .0001" Accuracy in 24" Range

Cadillac Pla-Chek provides height gage or micrometer settings five to twenty times as fast as any other gaging method of comparable accuracy. In fifteen seconds or less, Pla-Chek establishes *any* dimension within its twenty-four inch range to limits of less than one ten-thousandth inch. No auxiliary gage blocks are necessary—Pla-Chek is totally self-contained and extremely simple in operation. Dimensions can be taken either from the surface plate or from a base line on the work. Measuring bar is not touched by hand and is unaffected by body heat. Widely adopted for surface plate layout, surface plate inspection and master reference. Order Pla-Chek today. Write for literature.

Cadillac PLA-CHEK

SPEEDS AND SIMPLIFIES SURFACE PLATE INSPECTION



MICROMETER THIMBLE

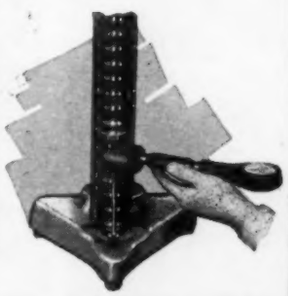
Micrometer thimble graduated to .0001" provides dimensions intermediate between 1" steps on measuring bar. Measuring bar can be adjusted to centerline of work to be inspected, enabling the user to take readings up or down relative to a center line or other reference line on the work.

MEASURING BAR

Measuring bar is made of deep-frozen strain-free alloy steel and all reference surfaces are ground and lapped to extremely accurate tolerances.

FOR MASTER REFERENCE

Inside micrometers, telescoping gages or internal cylinder gages can be checked between a lapped reference button in the base, and a Reverse Checking Plate clipped to the measuring bar.

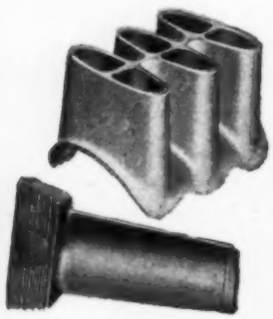


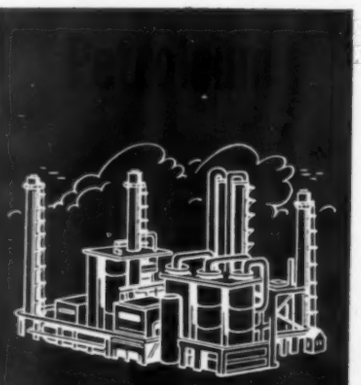
Cadillac GAGE COMPANY

20316 HOOVER ROAD DETROIT 5, MICHIGAN

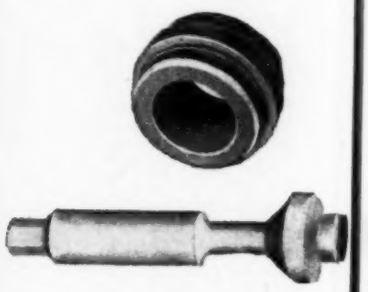
throughout industry

Parts for Jet and Conventional Airplanes

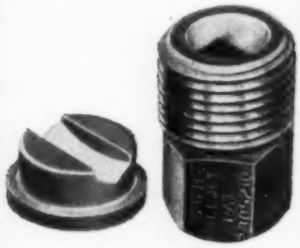


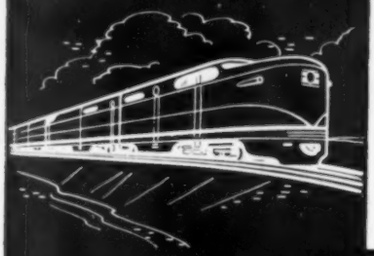


Valve Parts Used in Petroleum Refinery

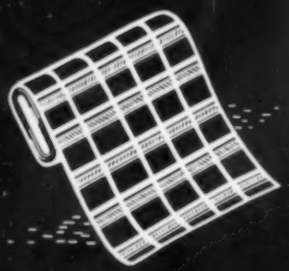


Spray Nozzle Parts for Handling Corrosive Chemicals

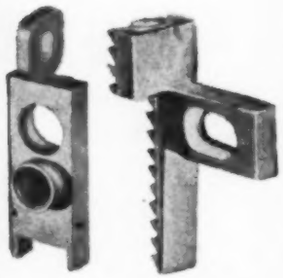


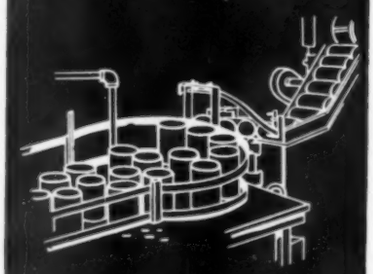


Diesel Engine Parts

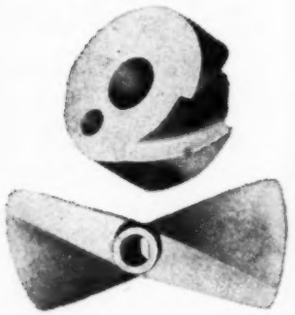


Left: Cloth Cutting Slide
Right: Sewing Machine Feed Dog

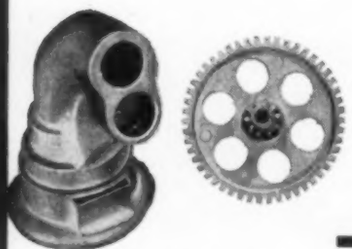




Top: Canning Machinery Part
Bottom: Impeller



Left: Scarfing Blowpipe Head



Right: Gear for Steel Mill Pickling Tank

HAYNES TRADE-MARK *alloys*

HAYNES precision castings

MEET THE TOUGHEST SERVICE CONDITIONS

You can now specify parts produced from alloys that dominate the field where high strength and resistance to heat, corrosion, and abrasion are required. Parts can be engineered for performance rather than convenience of fabrication, since intricate parts can be produced economically by the HAYNES precision casting process. HAYNES precision castings are uniform in quality, size, contour, and finish.

In many industries HAYNES precision castings are solving difficult problems of design, fabrication, and materials. For more complete information, write to any district office for your copy of the booklet, "HAYNES Precision Castings." Our engineers will be glad to discuss with you the possibility of producing your parts by this new method.

The registered trade-marks "Haynes," "Haynes Stellite," "Hastelloy," "Hascrome," and "Multimet" distinguish products of Haynes Stellite Company.

You Can Obtain Precision Castings of these HAYNES Alloys

HAYNES STELLITE TRADE-MARK

Cobalt-chromium-tungsten alloy for resistance to wear, heat, and corrosion

HASTELLOY TRADE-MARK

High-strength nickel-base alloy for resistance to heat and corrosion

HASCROME TRADE-MARK

Iron-base composition for resistance to wear and impact

MULTIMET TRADE-MARK

Cast or wrought heat-resistant alloy

HAYNES Precision Castings are also available in Type 303, Type 316, Type 310, Type 347, Type 410, Type 440-C, and other AISI grades of stainless steel, containing 12 per cent or more chromium.

Haynes Stellite Company

Unit of Union Carbide and Carbon Corporation

UCC

General Offices and Works, Kokomo, Indiana

Chicago—Cleveland—Detroit—Houston—Los Angeles—New York—San Francisco—Tulsa

How to give metal products the right finish—

the efficient, economical, sales-building methods that produce more attractive products—

SUPPLIES UP-TO-DATE INFORMATION ON:

—the techniques involved in metal finishing
—the commercial aspects of metal finishing
—the sales value of attractive finishes
—the economics of metal finishing
—the design of parts which require finishing
—new finishing equipment and processes
—metal finishing costs

THERE'S a manual which demonstrates the vital importance of the finishing process in the final appearance and sales appeal of a product, and describes each of these processes in careful detail so that you may achieve an attractive finish as efficiently and economically as modern methods will allow. With special attention to improving results and reducing costs, the book covers all types of finish, such as galvanizing, polishing, plating, lacquering, enameling and painting—wood grain reproduction, chromium plating, and synthetic enamels, and many new finishes of a specialized nature.

Just Published!

FINISHING METAL PRODUCTS

By HERBERT R. SIMONDS
Consulting Engineer
and ADOLPH BREGMAN
Consulting Engineer, Executive Secretary, Masters Electro-Plating Association

New Second Edition

352 pages, 5¼ x 8¼, 147 figures, **$4.00**

The revised edition of this highly useful manual describes the many new developments which have taken place during the war, and incorporates the rapid progress in plastics and synthetic resins. New chapters on coloring metal, on costs and estimates and on organic coatings have been added. Answers to every kind of question which arises in connection with the finishing processes are supplied in careful detail, aiming at the most efficient and economical means of achieving a highly attractive finished product with a maximum of selling appeal.

Read this partial list of chapter headings for a few of the important processes and topics described:

Sales Value of Attractive Finish
Importance of Color
How to Minimize Cleaning Expense
Pickling for a Better Finish
Polishing in Industry
Designing Products to Reduce Polishing Expense
Recent Developments in Plating
Chromium Plating
Spray Coating
Electroplating Costs and Estimating
Synthetic and Novelty Finishes
Enameling and Lacquering
Coloring Aluminum
Porcelain Enamel

See the book 10 days FREE • Mail Coupon

McGRAW-HILL BOOK CO., 330 W. 42 St., NYC 18

Send me Simonds and Bregman's FINISHING METAL PRODUCTS for 10 days' examination on approval. In 10 days I will send $4.00, plus few cents postage, or return book postpaid. (Postage paid on cash orders.)

Name .....

Address .....

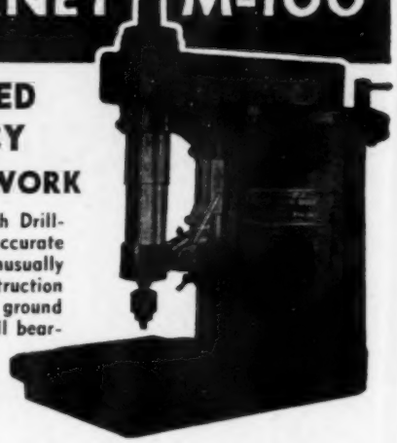
City and State .....

Company .....

Position ..... F.A. 1-16-47

(For Canadian price, write Embassy Book Co., 12 Richmond St., E., Toronto 1)

SIGOURNEY M-100



MAINTAINED ACCURACY IN PRECISION WORK

The Sigourney M-100 Bench Drilling Machine is extremely accurate on precision jobs. It is unusually sturdy and rigid in construction . . . has hardened and ground spindles . . . and sealed ball bearings throughout. All moving parts are entirely closed for maximum operator safety. M-100 is built for long and steady service.

This sturdily constructed bench drilling machine is available in 1, 2, 3, and 4 spindle models . . . speeds from 4,000 to 10,000 r.p.m.

Send for Illustrated Bulletin

THE SIGOURNEY TOOL CO.
Hartford 6, Conn.

Sole Sales Agents
PRATT & WHITNEY
Division Niles-Bement-Pond Co. . . . West Hartford, Connecticut

The RANDALL & STICKNEY Platform Gauge

. . . . takes work up to 7 inches

Work of similar size can be quickly and easily inspected by setting gauge head at desired height with standard block or plug. Spindle on gauge head travels ½".

Dial graduated 0 to 50 in thousandths; second-hand records 10ths of inches. Can be furnished to read to .01 mm.

Base 6" square; height 13"; weight 18½ lbs.

Investigate Now!

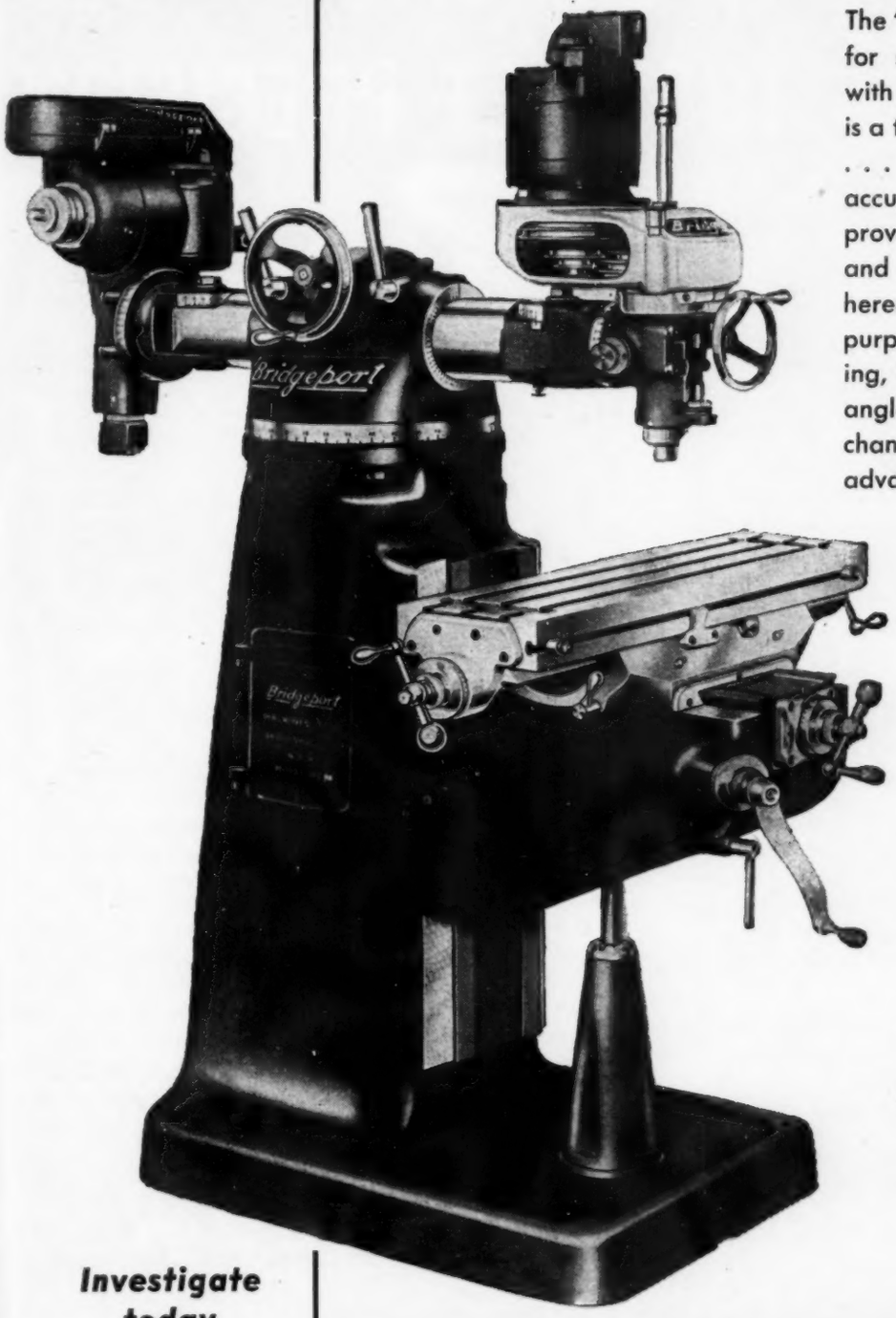
FRANK E. RANDALL CO.
248 Ash Street
Waltham 54, Mass.

DIAMONDS FOR WHEEL DRESSING TOOLS
DIAMONDS FOR THREAD GRINDING TOOLS
DIAMONDS FOR ALL INDUSTRIAL PURPOSES

KOEBEL

Koebel Diamond Tool Co., 9456 Grinnell Ave., Detroit 13

Bridgeport TURRET MILLING MACHINE



The "Bridgeport" is the machine for shops that are concerned with present and future costs. It is a thoroughly *proved* machine . . . proved for power, speed, accuracy and durability. It is proved also for time savings and cost-cutting which are inherent in its design. Its multi-purpose service in milling, drilling, boring and shaping at all angles of the work without changing set-up is being taken advantage of in the tool rooms and production departments of many of the largest plants. It will pay you to investigate.

SPECIFICATIONS

Longitudinal Feed—20"
Cross Feed—9"
Vertical Feed of Knee—16"
Standard Table—9" x 32"
Special Tables up to 48" available; also longitudinal power feed
Weight with Shaping Unit—2000 lbs.

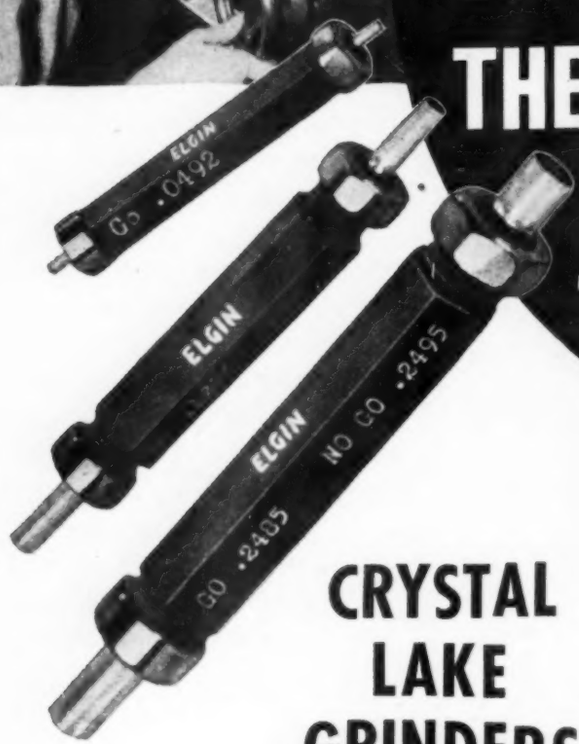
Investigate today

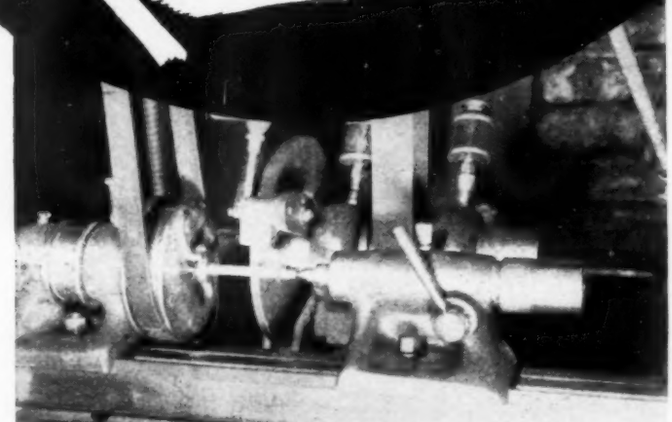
Bridgeport MACHINES, INC.
BRIDGEPORT
CONN.

HARDNESS OF SAPPHIRE

means: . . . . .

THE TOUGHEST KIND OF GRINDING . . . BUT THEY GET PRECISION *Results*





CRYSTAL LAKE GRINDERS

ABOVE you see one of a number of carefully controlled accurate operations used to produce precision SAPPHIRE Cylindrical Plug Gage members. The SAPPHIRE PRODUCTS DIVISION of the Elgin National Watch Co. must grind Sapphire to close tolerances to make these parts. They find Crystal Lake Super Precision Bench Grinders help make possible the required results.

The small size and convenience of controls on these machines make them more adaptable for operations on these parts.

Grinders that can do this tough job have many applications in plants that grind metals to close tolerances.

Write and let us cooperate with you in the application of Crystal Lake Grinders to your grinding problems.

● The high quality surface finish produced by CRYSTAL LAKE GRINDERS is a result of the SPRING LOADED SEPARATE MOTOR DRIVE which removes all motor vibration and maintains a correct belt tension so as to use full horse power of motor.

Tolerances can be held to a plus or minus O because of hinged spring mounting of motor which takes motor recoil when starting the motor.

Crystal Lake GRINDERS

NOT INCORPORATED

CRYSTAL LAKE, ILL., U. S. A.

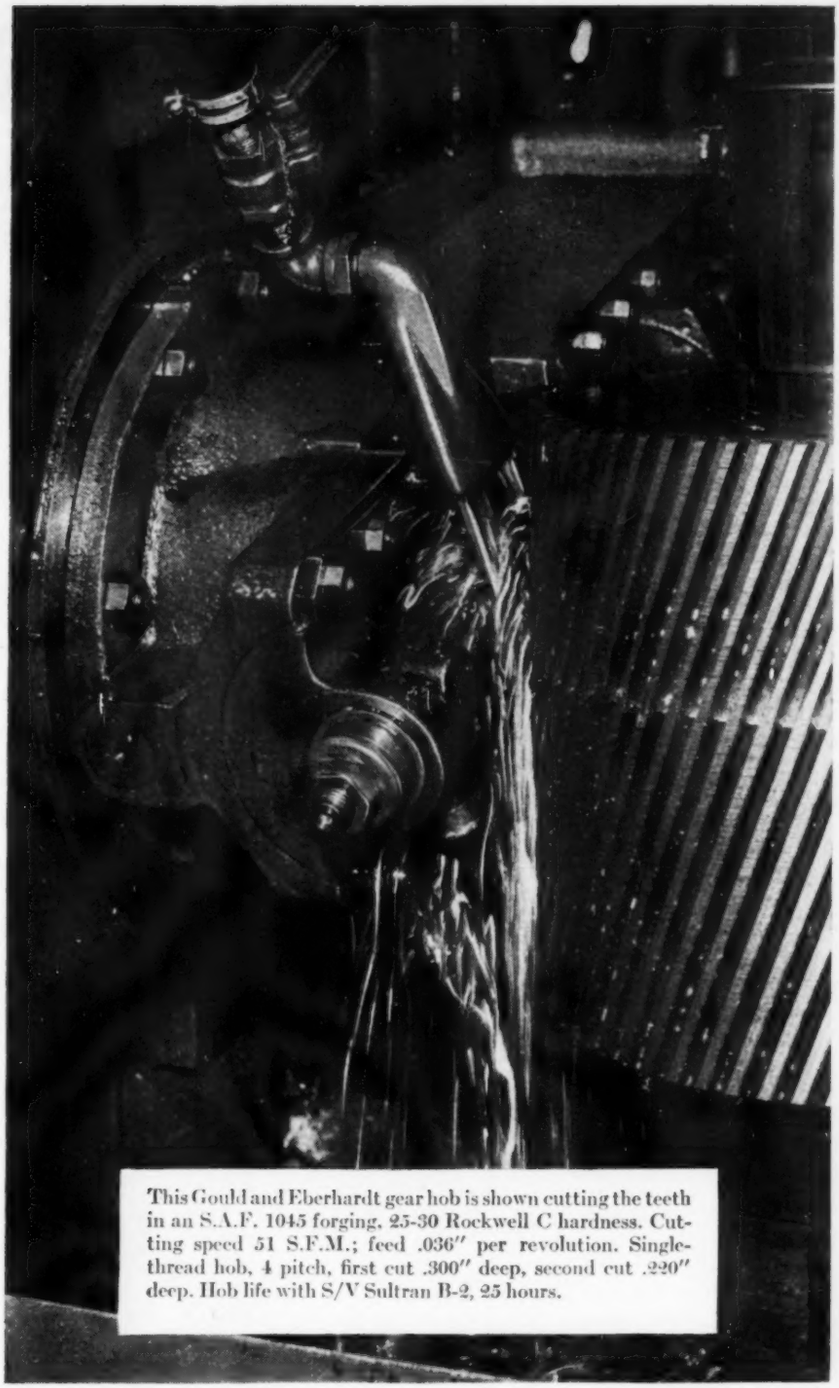
MANUFACTURERS OF PRECISION GRINDERS SINCE 1910

Inside Knowledge on Metal Cutting Problems

—TOOL LIFE—

This is One of a Series of Messages on Common Problems in Your Plant

Long Live Your Gear Hob!



This Gould and Eberhardt gear hob is shown cutting the teeth in an S.A.E. 1045 forging, 25-30 Rockwell C hardness. Cutting speed 51 S.F.M.; feed .036" per revolution. Single-thread hob, 4 pitch, first cut .300" deep, second cut .220" deep. Hob life with S/V Sultran B-2, 25 hours.

ON PRECISION WORK, like the gear hobbing job shown right, the life of your cutting tool can mean the difference between profit and loss on the entire operation.

For instance, the longer your hob cuts without re-sharpening, the more continuously your operator can produce. And, as you know, your overhead goes on just the same, whether your machines and operators are working or not. Therefore, the longer your hob lasts, the lower your production costs.

With so much at stake, it's important to get cutting oils that assure the longest possible tool life, as well as accuracy in size and finish, and fewer rejects. This means new transparent S/V Sultran Oils. Now proved in hundreds of plants, these new oils give you the exceptional lubricity, good anti-weld and pressure resistance qualities and maximum cooling and drainability characteristics that are necessary for maximum production, at lowest ultimate costs. In addition, they're also light-colored and odorless for better visibility and more pleasant working conditions.

Get these new oils now for longer tool life and all that this means in terms of greater profits.

SOCONY-VACUUM OIL CO., INC.
and Affiliates: Magnolia Petroleum Company
General Petroleum Corporation

SOCONY-VACUUM

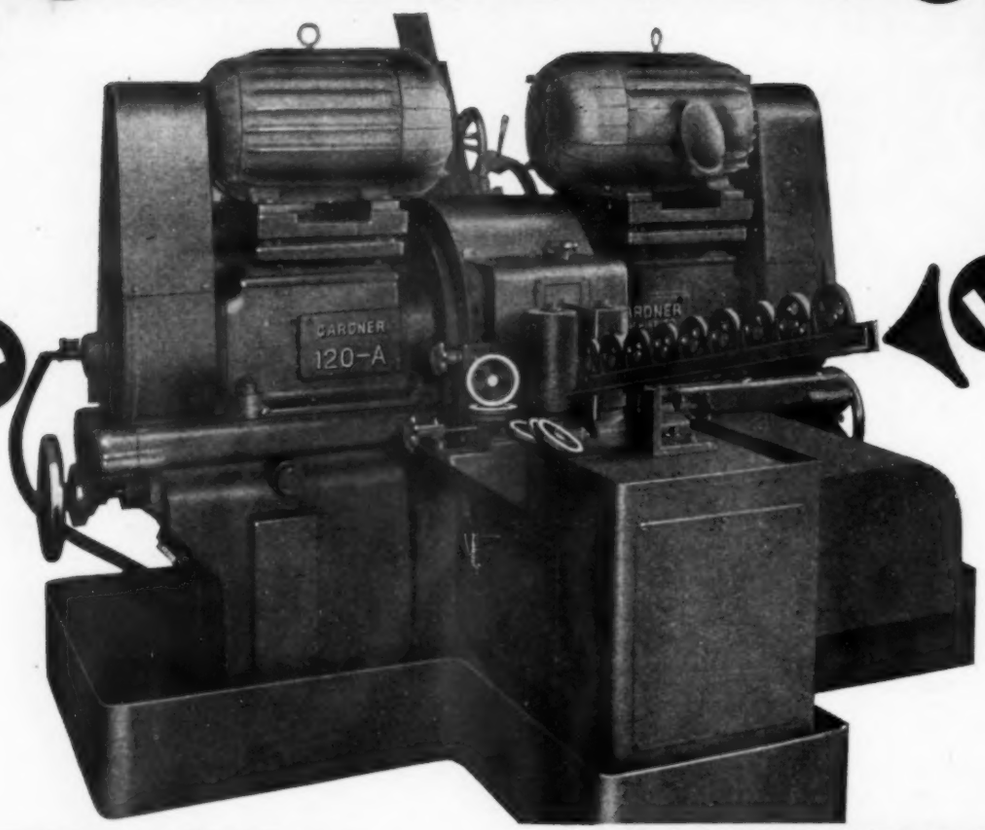
Lubricants

TUNE IN THE MOBILGAS PROGRAM — MONDAY EVENINGS, 9:30 E.S.T. — NBC

Socony-Vacuum Correct Lubrication

FOR EVERY MACHINE . . . EVERY OPERATING CONDITION

SPEED PRODUCTION WITH



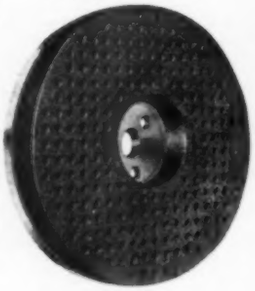
GARDNER *Double* GRINDERS!

PRODUCTIBILITY per man, and overall plant capacity, are being increased in hundreds of shops by the use of High-production GARDNER Double GRINDERS.

A typical case is the grinding of TWO sides of cast steel gears — at ONE set-up — in a large mid-western plant.

A semi-automatic "push-through" type attachment, feeds the gears in a constant stream along two steel guide bars that extend clear through between the opposed wheels of this No. 120A-23" Double Spindle GARDNER GRINDER. They unload at the rear by gravity.

GARDNER WIRE-LOKT ABRASIVES



ARE *Modern* CUTTING MEMBERS

PRODUCTION: 20 to 25 pieces per minute.

TOLERANCES: .002" to .004" for uniformity; .001" for parallelism.

STOCK REMOVAL: .030" to .040" maximum overall.

We invite interested production executives to visit our factory to see how Gardner Grinders *actually do* speed production on dozens of flat surface jobs. Many late-model units are normally available for your inspection.

GARDNER GRINDERS *will* speed production on many of your flat surface jobs — write for additional data on GARDNER-GRINDING!

GARDNER-GRIND YOUR *Flat* SURFACES

Write for additional data on GARDNER-GRINDING!

GARDNER MACHINE COMPANY

410 East Gardner Street . . . . Beloit, Wisconsin, U.S.A.

engineered Tools and Gages by

METRO

Accuracy and precision are yours when you specify METRO. For METRO Carbide Tipped Tools and Gages have been engineered to meet your most exacting requirements by men who know how to make tools for men who know how to use them. No matter what your production needs—whether Standard or Special Tools and Gages—METRO'S industrial experience and knowledge will provide the proper answer. See your distributor or write direct.

METRO TOOL AND GAGE COMPANY

4240 Peterson Avenue · Chicago 30, Illinois

For Reflex Copy Negatives of CAMERA QUALITY

Without the Use of a Camera

USE . . DINOREFLEX "IT HOLDS SIZE" SAFETY FILM

DIMENSIONALLY PRECISE *and of* High Contrast

WRITE for complete and authoritative information regarding its dimensional stability in the copying of Industrial Templates, Drawings, Charts and Maps.

DINOREFLEX FILM has a translucent white, stable, vinyl copolymer plastic base; is lighter and thinner than glass and free from breakage. Easily handled and stored.

To use DINOREFLEX FILM, place the emulsion face in *direct contact with the copy.* Exposure is *through the back of the film.* Normal photographic procedure is followed in developing the negative image.

PHOTOGRAPHIC DI-NOC PRODUCTS

★ *Other DI-NOC registered Trade Mark photographic products are:* DINOBASE, DINOLOFT, DINOGRAPHIC, DINOBLUELINE, DINOCLOTH

THE DI-NOC COMPANY • *Photographic Division* • **Cleveland 12, Ohio**

Sterling-EASYMOUNTS

for **BETTER, FASTER TOOL GRINDING**

Buy the

EASYMOUNT CHUCK ONCE— ORDER WHEELS AS NEEDED

TESTED by many months on many jobs, Sterlings's Easymounts and Wheels have proven themselves "tops" for faster, better grinding of all kinds of tools—steel and tungsten carbide.

The Easymount, fastened to your grinder, becomes a permanent part of the machine, yet is readily released when necessary. The wheel is rigidly held by the unique spring construction of the Easymount which permits easy removal for insertion of a new wheel when desired.

Test Sterling's Easymounts and Wheels on your tungsten carbide jobs. You will find there is speedier work done with greater economy with this popular grinding innovation working for you.

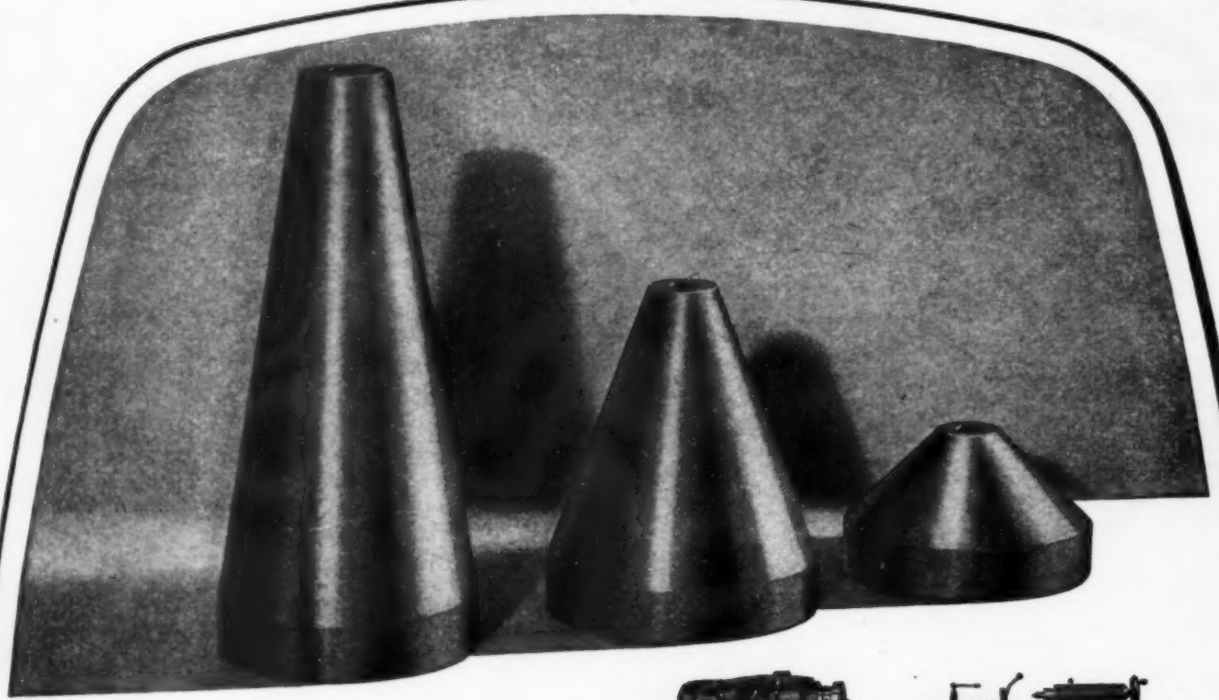
Sterling engineers will show you how quickly and easily you can attach the Easymount to your grinders with profitable results. No obligation—ask for this service.

• Send for this descriptive folder on the Sterling Easymount and Wheels. Gives specifications and prices on all machines.

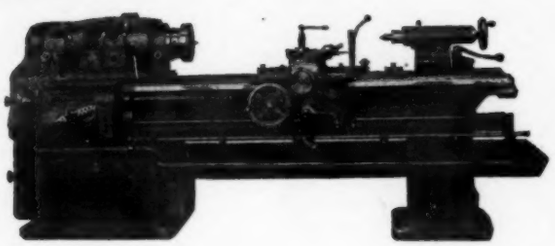
• STERLING ABRASIVES •

THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY



The Story of the Three BARS



Hendey 16", 18-speed Geared Head Lathe

Once upon a time there were three bars—one tapered long and thin, one with a medium taper and one tapered short and fat. How would you turn them out? Would you just hook up the taper attachment on any lathe? Well you're almost right, but look again—look at their beautiful finish, satin-smooth—no tool marks—it's the most beautiful lathe finish you ever saw—a finish that an ordinary lathe could not match. It took a Hendey Precision Tool Room Lathe with a Hendey Taper Attachment. It took a Hendey because it has such features as—shaved gear headstock, super precision, matched spindle bearings, automatic lubrication—features that mean absolutely no chatter, cuts of unbelievable accuracy and years of trouble-free operation. Production figures will please you, too, for the Hendey 16" Precision Lathe has 18 speeds—a wide range of feeds. If you have a variety of tool work requiring super-precison machining, it will pay to investigate Hendey Tool Room Lathes and Hendey Attachments more thoroughly—write for complete details!

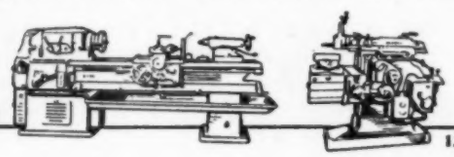
The Hendey Machine Company

Hendey

Main Office and Plant — Torrington, Connecticut

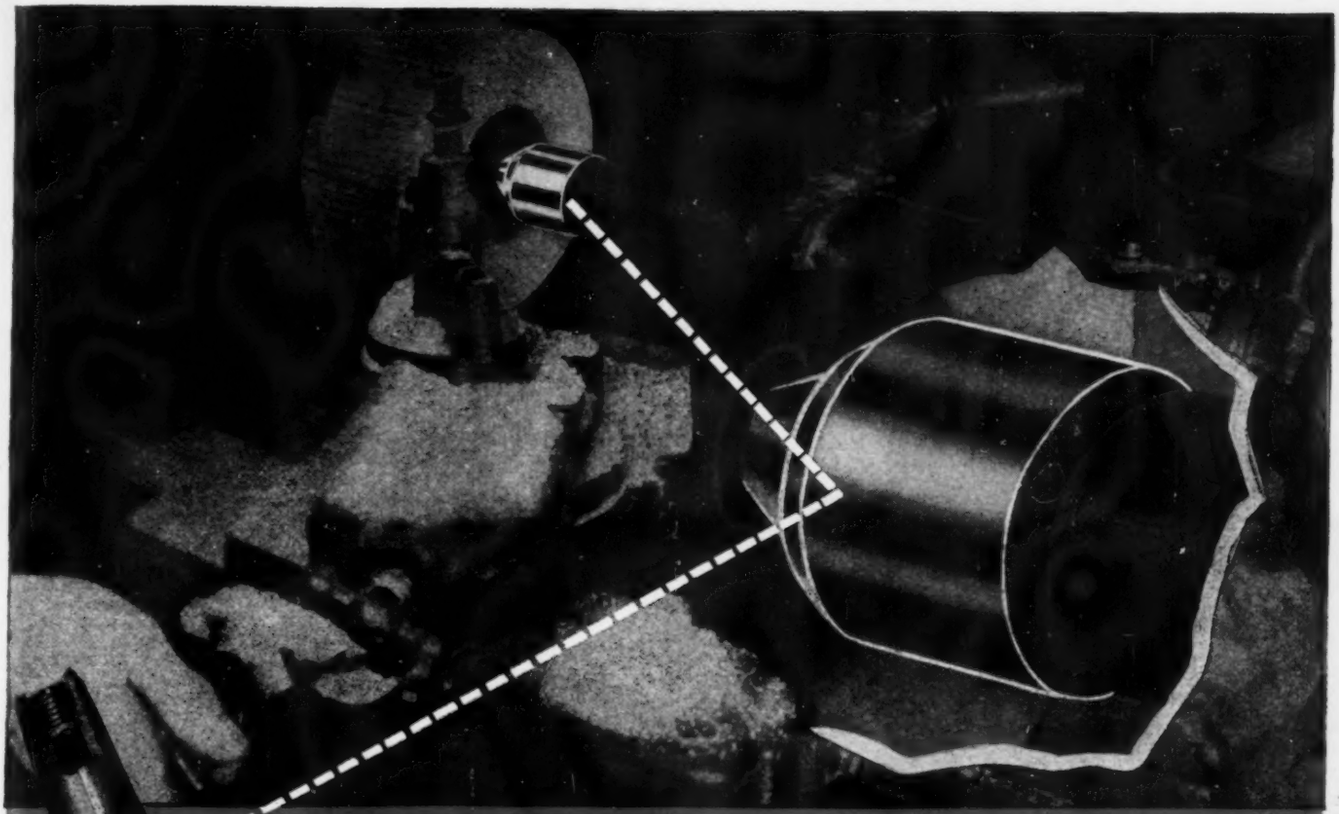
Branch Offices — New York, Chicago, Boston, Detroit, and Rochester

Representatives in — Phila., Cleveland, Los Angeles, Pittsburgh, San Francisco



TOOL ROOM LATHES
12"-16"-18"

SHAPERS
12"-16"-20"-24"-28"



LATHE OUTPUT *Increased Up to 25%*

with IDEAL LIVE CENTERS

PREVENT BURNING of WORK and CENTER

"Lathes are running 10% to 20% faster and output being increased up to 25% on most jobs with Ideal Live Centers" says a large manufacturer of fibre products; who also reports that "burning" of the fibre, formerly caused by the friction heat generated between the dead centers and the work, has been entirely eliminated.

IDEAL Live Centers increase production and reduce costs because they permit machines to run faster and take deeper cuts. IDEAL Live Centers rotate with the work, on ball and roller bearings, preventing friction heating and burning of work or center. They save the frequent delays to machines to replace dead centers, save set-up time, as well as the replacement cost of fast-wearing dead centers.

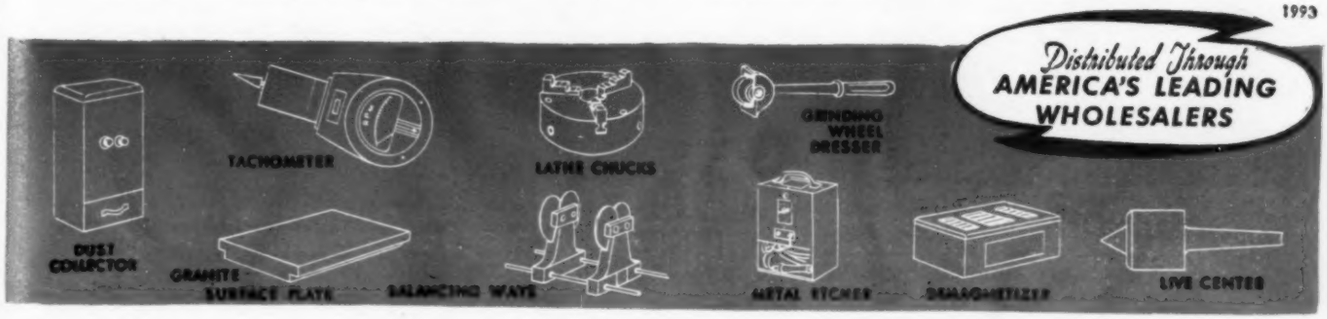
No matter what materials your lathes work on, it will pay you to get the facts on IDEAL Live Centers. Our catalog of IDEAL Live Centers and other Machine Tool Accessories will be sent promptly on request.

IDEAL INDUSTRIES, Inc.

(Successor to Ideal Commutator Dresser Co.)

1057 PARK AVENUE SYCAMORE, ILLINOIS

1993



NEW COMPLETE LINE OF *ROTO-FINISH* MACHINES

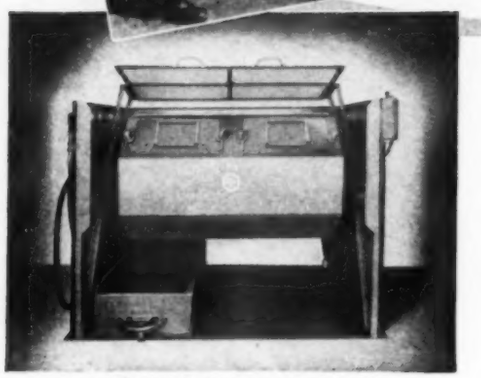
TO DO YOUR MECHANICAL FINISHING *QUICKER, EASIER, MORE EFFICIENTLY*

FOUR new improved Roto-Finish Machines and labor saving accessories are now available for use with Roto-Finish mechanical finishing—to provide even greater savings in time, costs and labor!

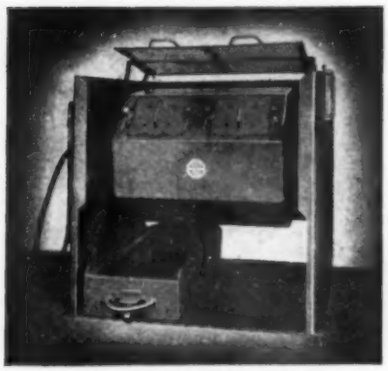
These features found in all four types of machines put your finishing operations on a speedier production basis:

1. Quick acting door mechanism. Light weight doors for easier, faster loading and unloading.
2. Rigid safety guard lifts easily, pivoting on positive control.
3. Hose and quick acting water valve mounted conveniently on frame of machine.
4. Integral mounted motor provides steady, stable drive. Easily accessible for maintenance. Shielded for water protection.
5. Machines have swivel type hoist pan for greater movability. Equipped with safety lock type cross bar for hoist operation.
6. Forward-reversing switch and magnetic brake control location of cylinder doors to facilitate loading and unloading.
7. All welded steel cylinders are hard wood lined. Compartments have patented relining feature.

THE STURGIS PRODUCTS CO., 702 JACOB ST., STURGIS, MICH.



Roto-Finish Model CW 60-2 Machine
Compartment size 27" x 32" I. D.

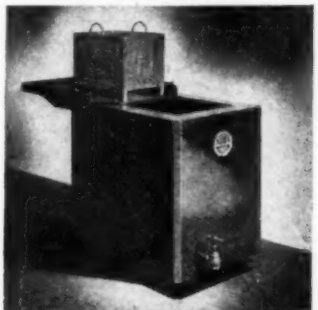


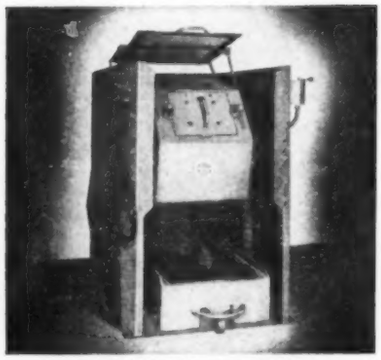
Roto-Finish Model CW 45-2 Machine
Compartment size 19" x 32" I. D.

Roto-Finish Dual Midget Machine
Compartment size 8" wide, 12" across flats

SPEEDS HANDLING—
REDUCES LABOR BURDEN!

Roto-Finish Dip Tank (oil or water)





Roto-Finish Model CW 22-1 Machine
Compartment size 19" x 32" I. D.

Roto-Finish Chip Bin

Roto-Finish Separating Table with Hopper

ROTO FINISH

Send For New Folder! Shows How You Can Save With Roto-Finish!

The Accepted Mechanical Finishing Process
For Grinding, De-Burring, Polishing, Britehoning, Coloring

Announcing AN IMPORTANT ADVANCEMENT in MACHINING with *Carbide*

New OK INSERTED CARBIDE TIPPED TOOL BITS and HOLDERS

Adjustable for wear . . . Serrated for clamping security . . . Interchangeable for quick and easy replacement

SIX INTERCHANGEABLE shapes of tungsten carbide tipped tool bits for one holder — one right-hand and one left-hand tool bit for boring, turning and facing.

ADJUSTABLE — The first job-engineered inserted type carbide tipped tool bits adjustable to compensate for side wear.

SERRATED — The only carbide tipped tool on the market with the famous OK mated serrations on holder and inserts, to insure positive clamping and freedom from vibration.

QUICK CHANGE — If replacement is necessary for regrinding or next operation, simply stop machine, loosen set screw, insert the proper tool bit without disrupting your set-up, and proceed. All shapes of tool bits, size for size, have uniform tool height.

GREATER PRODUCTION — Changing from high speed tools to carbide increases production about four to one. Your low initial investment quickly pays for itself.

LOW COST — List price 400F Holder 1¼ inch shank, 1¼ inch tool height, $5.25. Set of six carbide tipped tool bits (three right and three left hand for boring, facing, turning) $30. In quantities of 50 and over as low as $3.45 net each tool bit. Other sizes in proportion. Holders come in five sizes: ⅝ inch, ¾ inch, 1 inch, 1¼ inch and 1½ inch square.

THE OK TOOL COMPANY 26 Hull Street, Shelton, Conn. Division Aerodynamic Research Corporation

AMERICA'S NUMBER ONE INSERTED BLADE *Milling Cutters . . . Boring Tools . . . End Mills*

Making Die Head History

When H & G goes to work for you

YOU will always remember the day you change to H & G Insert Chaser Die Heads. Your threaded parts production picture undergoes a complete transformation. As you walk by the machines you will see

— IDLE men at BUSY automatics.

— NOT BUSY men at IDLE automatics.

The former spells PRODUCTION . . . PROFIT; the latter spells NON-PRODUCTION . . . LOSS.

Based on a recent impartial survey, screw machine experts voted H & G Insert Chaser Die Heads their *number one choice.*

A DAYTON man gives this reason: "*Holds size better. Threads straight and true.*" A NEW HAVEN man says: "*Accuracy, performance, economy.*" A man in HARTFORD writes, "*More threads per grind.*" From CINCINNATI comes this: "*For close to shoulder threading.*" From SAN DIEGO a leading screw machine parts producer writes: "*Interchangeability of chasers for different styles of die heads.*" A manufacturer in WORCESTER says: "*Low price chasers . . . Quick to set. Uniform high quality threads.*"

Simple Strong Accurate

Sizes and Styles for all machines on which threads are cut

H&G Insert Chaser DIE HEADS

LITERATURE ON REQUEST

THE EASTERN MACHINE SCREW CORPORATION

Manufacturers of H & G DIE HEADS · THREADED RODS · SCREW MACHINE PRODUCTS

20-40 BARCLAY STREET, NEW HAVEN, CONN.

Almond Drill Chuck

. . for over 70 years

ALMOND THREE-JAW DRILL CHUCKS—the first to be placed on the market more than seventy years ago—pioneered the field of drill chucks. ALMOND CHUCKS have continued to be a necessary part in the logical procedure of machine developments.

Made in types and sizes to fit all machine tools and portable drills.

Write for further information.

The Original Manufacturers of Drill Chucks

T. R. ALMOND MFG. CO.

Ashburnham, Mass., U.S.A.

MARKS FIGURES IN SAME OPERATION

Noblewest make both the machines and the dies for precision graduating on round or flat surfaces. Hand or power operated, they save you time and costs as both the graduations and figures are rolled permanently into the piece in one operation. Tell us your graduating requirements and we'll submit our recommendations and prices. Noble & Westbrook Mfg. Co., 17 Westbrook St., East Hartford 8, Conn.

MARK IT BEST WITH

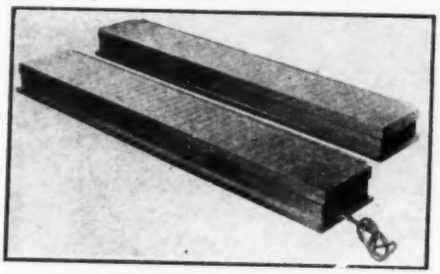
NOBLEWEST

Precision Graduating Machines

WALKER MAGNETIC CHUCKS GRINDING MACHINES

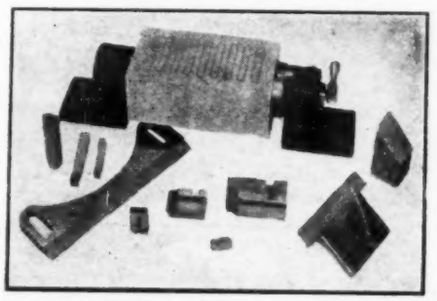
The WALKER LINE

Included in the complete Walker Line are Electro Magnetic and Permanent Magnetic Chucks for use on grinders, lathes, shapers, planers, drilling machines, etc. for both tool room and production service. A complete range of sizes is offered in Rectangular, Swivelling, Vertical Face and Rotary types. Illustrated literature is available giving specific information. The chucks shown here are typical in the Walker Line.



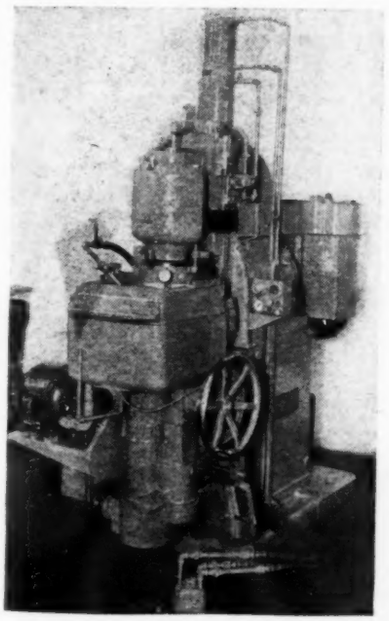
#1062 Multi Coil Magnetic Chucks

While in most cases standard chucks are entirely suitable, Walker design is such that a wide range of face plate construction is readily available.



Swivelling Type Permanent Magnetic Chuck

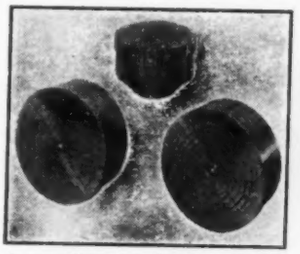
A new line of Permanent Magnetic Chucks is now available from Walker. These chucks have 35% more holding power, greater effective magnetic area and retain holding power indefinitely. Swivel types are made in the following sizes: 4" x 8", 6" x 18", 8" x 24".



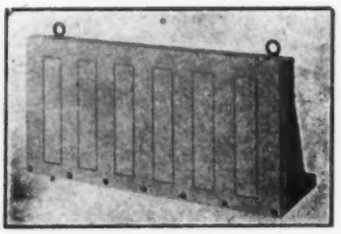
New development in the Walker Single Stroke Surface Grinder, Work Table can be tilted 15 degrees to grind bevels. Spindle operated and feed controlled by Air and Hydraulic Cylinders. High production and extreme accuracy assured.

●

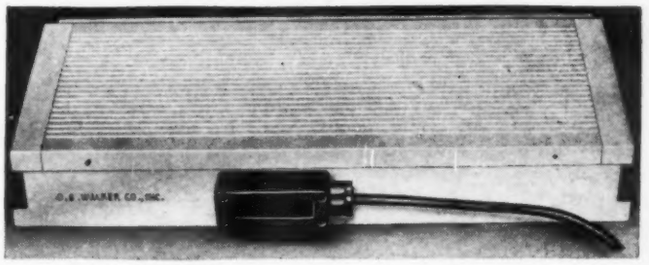
SEND FOR BULLETIN



Rotary Magnetic Chucks in standard diameters 6¼" to 36½". Standard, "Interlocking" and "Concentric Gap" Types available.

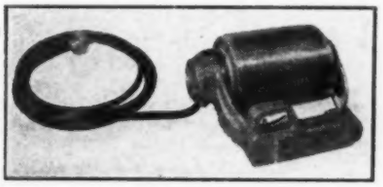


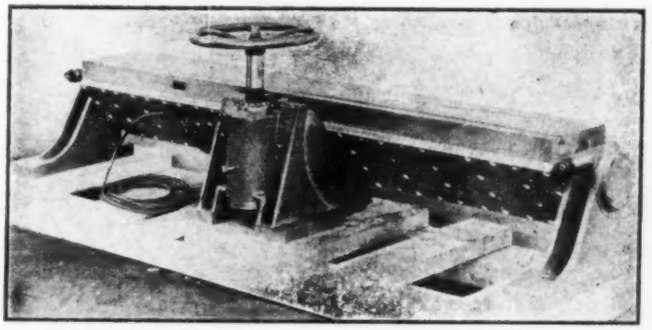
Walker Vertical Face Magnetic Chucks are made in a full range of working face sizes, are exceptionally strong and are adapted to a wide variety of work.



The new Walker 617 Longitudinal Bar Chuck, designed for hard usage and absolutely waterproof, is available in several sizes for early shipment.

Walker Demagnetizers are available in standard D.C. and A.C. Types for either 110 or 220 volt operation. The portable unit shown is suitable for the removal of residual magnetism from a wide variety of work.





Swivelling Type Magnetic Chuck with control

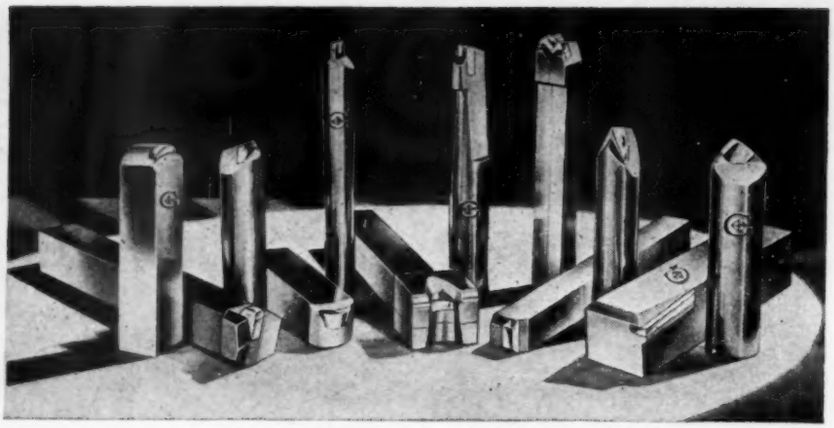
O. S. WALKER COMPANY, INC.

WORCESTER, MASS.

Makers of Rectangular, Swivel and Rotary Magnetic Chucks

GILMORE DIAMOND TURNING & BORING TOOLS...*for today's requirements in precision production*

Send for fully illustrated 36-page Catalog No. 46 containing complete information.



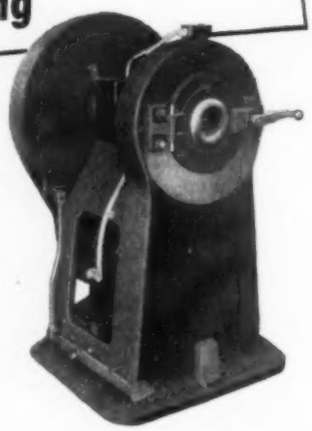
Gilmore Diamond Tools for machining are made to order and to conform to the blueprints furnished by customers. In spite of the highly specialized nature of this class of work, Gilmore is in position to render prompt service on users' requirements and to produce tools which assure the full benefits from using diamonds for cutting operations.

Gilmore takes full advantage of the superhardness of the diamond and its homeogeneous structure in developing tools which are finished to sharpest and longest-wearing cutting edges and which provide the proved means of faster cutting, finer work finish and closest tolerances. Consult Gilmore on your diamond boring and turning problems and be assured of a proper solution.

Also Diamond Tools for Grinding Wheel Truing; Hardness Testing Diamonds; Diamond Engraving Points; Diamond Gage Contacts; Diamond Styli.

F. F. GILMORE & CO. 285 COLUMBUS AVE. BOSTON 16, MASS.

"Standard" SWAGING MACHINES SHAPE AND JOIN METALS Without Cutting



● In one rapid operation "Standard" Swaging Machines reduce, point, and form tubing or bar stock — without loss of material. They also attach fittings to tubing, wire or cable. Parts swaged are smooth, strong and accurately sized. "Standard" Swagers have many special features for durability and fast, easy operation.

16MM SOUND FILM, *26 minutes, showing principle and applications of Swaging, offered engineering and production groups. Write for available dates.*

STANDARD MACHINERY COMPANY
1565 Elmwood Avenue • Providence 7, Rhode Island
MANUFACTURERS OF
Power Presses to 500 Tons • Rolling Mills • Swagers
Turks Heads • Steel Die Sets

Production Can Be Retarded By Using A Wrong Clamp

If the clamp sticks up too high above work to prevent easy manipulation under drill press—if it doesn't exert enough pressure in the right place—if too much time is consumed in applying and releasing clamp pressure—or in a word, if the right clamp isn't applied—production suffers.

These Knu-Vise Toggle-Action Clamping Devices Meet Every Condition

FOR GENERAL CLAMPING—*Use one of the KV Series*
Suitable for light or heavy duty—available with solid or channel toggle bar adaptable for variety of fixed or adjustable pressure spindles.

TO CLAMP VARYING THICKNESSES—OR WHERE CHANGE OF ANGLE IS REQUIRED—*use KK or KS Series*
The cam action of toggle bar of the KK style compensates for variations in thickness. The swivel plate of the KS style permits change in clamping position to be simply made.

WHERE WORKING CLEARANCE OVER CLAMPED WORK IS LIMITED—*use KP Series*
Both toggle bar and handle are horizontal, allowing free movement of operating tools above work, as in drilling, tapping, etc.

FOR HEAVY WORK—*use Toggle-Action C-Clamps*
The quick-fastening and quick-releasing feature of these C-Clamps is particularly advantageous when you work with heavy parts.

WHERE CLAMPING OPERATIONS ARE REQUIRED IN DIFFERENT PLACES—*P or KL Series answer*
Toggle action pliers (really small portable clamps) can be put to use anywhere in plant. Wide variety of models provide extensive range of applications.

Send for New Catalog.

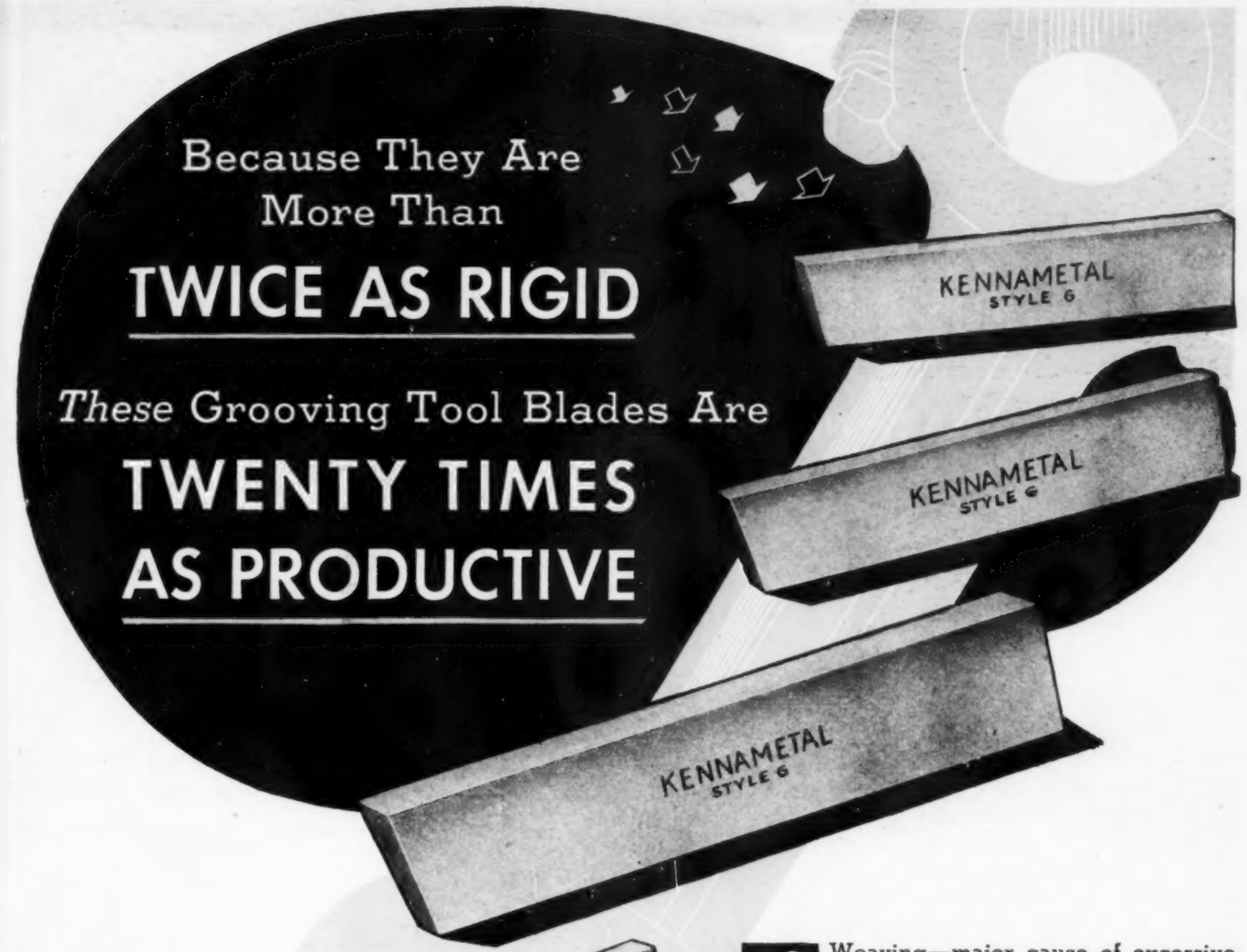
KNU-VISE INCORPORATED
2217 Eighth St., Detroit 16, Mich.
4328 San Fernando Rd., Glendale, Calif.

Because They Are
More Than

TWICE AS RIGID

These Grooving Tool Blades Are

TWENTY TIMES AS PRODUCTIVE



Weaving—major cause of excessive wear in slender grooving tool blades—can now be overcome by using sturdy, hard blades of solid Kennametal. Here's one example—

In a large automobile plant, solid Kennametal blades are now cutting piston ring grooves in 18,000 to 20,000 aluminum alloy pistons before resharpening, whereas the previously-used carbide-tipped steel-shank tools had to be serviced after cutting grooves in 800 pistons.

These new solid Kennametal blades cut better, longer, not simply because they are much *harder* than steel, *but primarily because their resistance to deflection is two to three times* as great as steel. Weaving that causes erratic cutting pressures, strains, and rapid cutting edge failure is thereby minimized.

Kennametal grooving tool blades are made in standard widths from .080" to .250". Other sizes are available. Ask our nearest representative, or write for prices and particulars.

KENNAMETAL

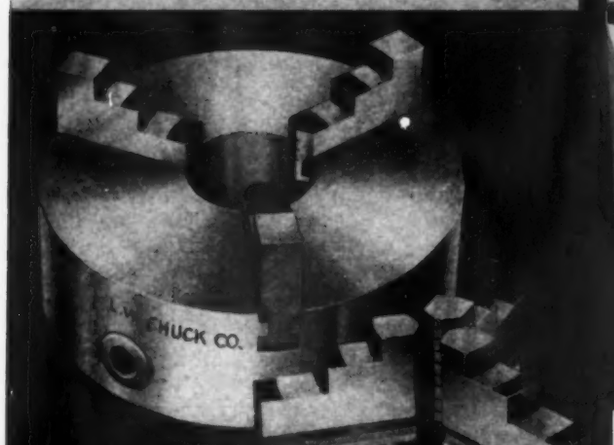
SUPERIOR CEMENTED CARBIDES

TRADE MARK REG. U. S. PAT. OFF.

KENNAMETAL *Inc.*, LATROBE, PA.

L-W LATHE CHUCKS

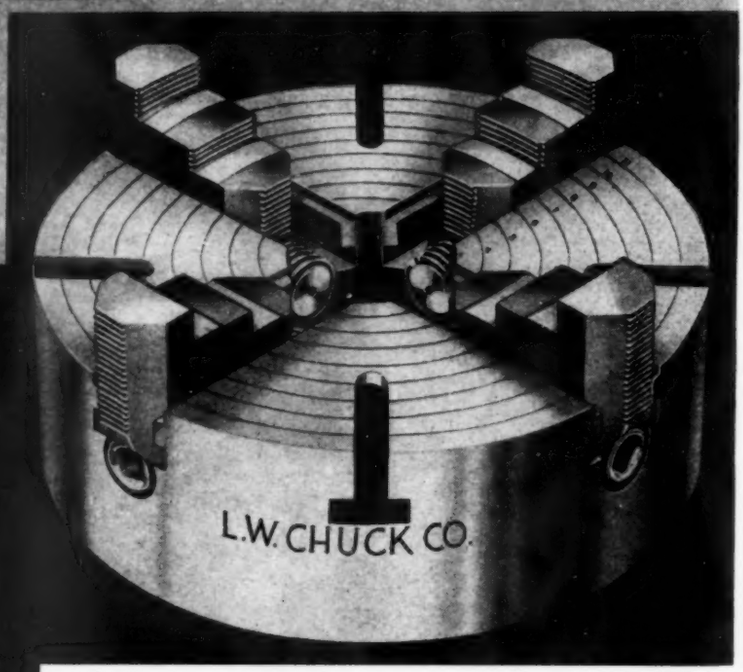
STURDY • ACCURATE • LOW IN COST
HARDENED STEEL REVERSIBLE JAWS,
SEMI-STEEL BODY



3-JAW UNIVERSAL LATHE AND SCREW MACHINE CHUCK

For light or heavy duty work. Guaranteed to run true. High grade alloy geared scroll and steel pinions.

6¼" $45.00 7½" $55.00 10½" $83.35



4-JAW INDEPENDENT LATHE CHUCKS

Wide gripping surface, oversize, tough nickel steel screws, steel thrust bearings assure durability.

10" $39.35 14" $50.40
12" $43.85 16" $66.25
18" $87.75

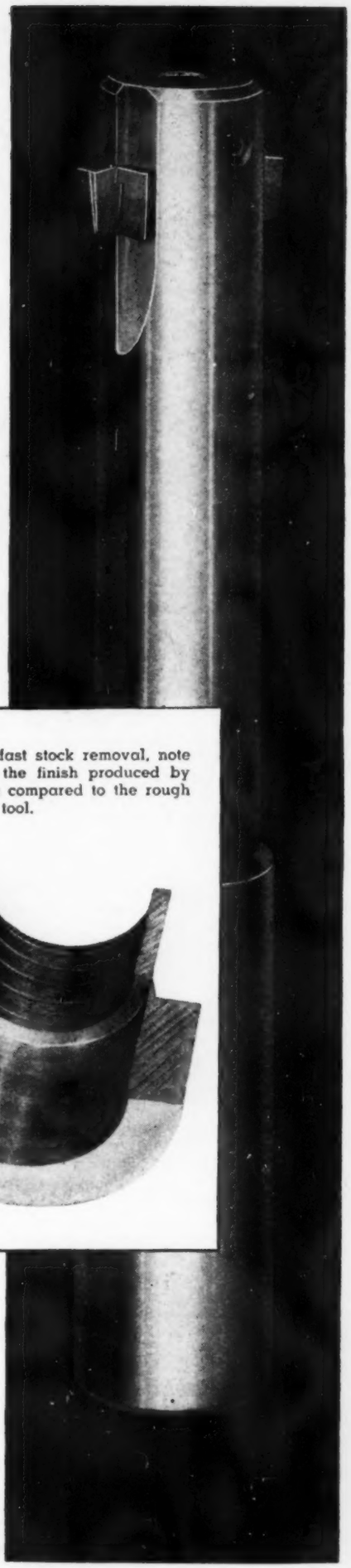
Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products

L-W CHUCK COMPANY 25 SO. ST. CLAIR ST. TOLEDO 4, OHIO

YOU WANT SPEED?

This New MADISON Rough Boring Tool

SLASHES HOLE COSTS!



This new Madison Rough Boring Tool is the fastest changing, fastest cutting boring tool made. Team it up with the Madison Reaming Cutter and you'll get more accurate finely finished holes at lowest cost. Like the Madison Reamer, the Roughing Cutter can be easily set to decimal sizes within its range. Because cutters may be presized, disturbance of the setup is unnecessary when inserting a new or sharpened cutter in the bar. Cutter change is a matter of seconds. Simply back off the lock screw in the bar and the cutter slips out for resizing or replacement.

Because of the Madison locating feature the cutter is automatically centered and the load on cutting elements equalized.

The cutter block is formed by the Madison cutting blades themselves. This exclusive Madison feature creates a more rugged cutter with no delicate mechanisms or separate parts which may break or get out of order.

Madison Roughers have been used to bore holes as large as 17.590 and are made in the smaller range to 1" size.

These exclusive Madison features of simplified design are the reasons why the new Madison Rough Boring Tool performs with amazing speed. On field tests, stock removal requiring three passes with a conventional single point tool was executed in one pass with this new Madison Rougher.

Besides combining accuracy with fast stock removal, note on the production sample below, the finish produced by the Madison Rough Boring Tool as compared to the rough finish produced by a single point tool.

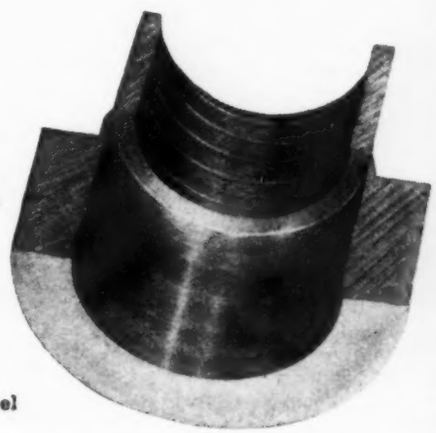
Material
Cast Steel.

Depth of cut
.697".

Feed
.0075" per revolution.

Surface speed
carbide tipped
352 FPM.

Surface speed
high speed steel
155 FPM.



Write for the Madison catalog today. Get the facts on Madison Boreamers, the tools that make one operation out of boring and super finish reaming.

MADISON MANUFACTURING COMPANY
DEPT. AM-5 **MUSKEGON, MICHIGAN**

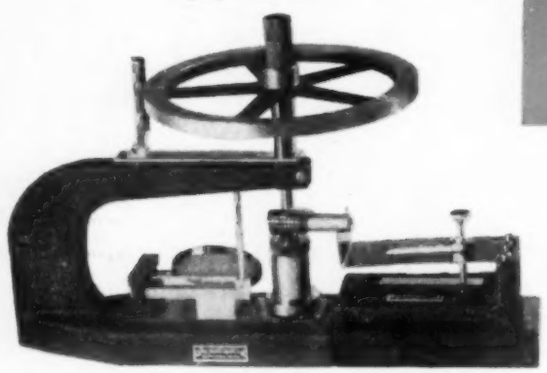
Van Keuren ... HEADQUARTERS FOR P

Use VK Carboloy Gages for long run jobs because of the enormous saving in gage cost.

Use VK Carboloy Gages on fussy jobs because of the infinitesimal gage wear. All parts will be within the specified limits.

Light Wave Micrometers

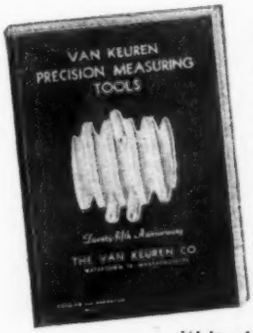
Provide accurate measurements without using gage blocks.



LIGHT WAVE MICROMETER

Readings may be duplicated to an accuracy of .00001" or .00002" by different operators without the use of gage blocks. The Light Wave principle applied in the Van Keuren Micrometer enables readings to be made at the same pressure and eliminates errors of feel or touch. This instrument is recommended for checking measuring wires, plug gages and small precision parts, also any parts made of soft material where a light measuring pressure must be applied.

Full information on Van Keuren precision measuring tools is given in our new Catalog and Handbook No. 33. This is a 160 page book containing complete tables, data and formulas for measuring threads, gears, gages and precision parts.



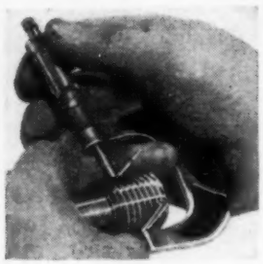
Write for your copy

THE ★ Van Keuren COMPANY 176 WALTHAM ST. W

R PRECISION MEASUREMENTS

THREAD MEASURING WIRES

Standard Equipment for measuring thread gages, taps and worms



Measuring pitch diameter of thread gage with Van Keuren "Best Size" Measuring Wires.

Manufactured to National Bureau of Standards specifications. Hardened, ground and lapped. Standard thread sizes accurate within .00002" for roundness and straightness and within ±.000025" for size.

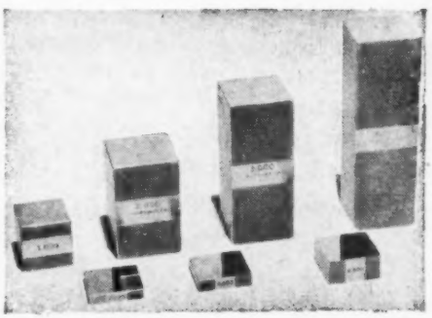
Stock sizes available for measuring U.S. Standard, Whitworth, Metric, British Association, Pipe, Acme and 29° Worm Threads. Specials available on order, from .002" diameter to 1.5708" diameter.

GEAR MEASURING WIRES

The simplified Van Keuren gear measuring system provides a more accurate means of measuring tooth thickness. Complete tables are furnished giving the measurement over the wires for 1 diametral pitch. The only calculation required is one of simple division.

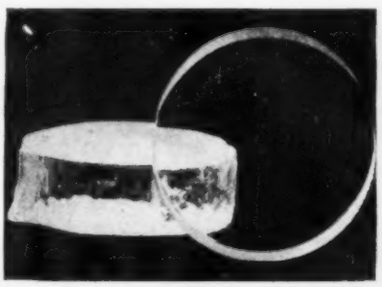
The system is based on formulas approved by the American Gear Manufacturers Association. Van Keuren Gear Measuring Wires are accurate within 25 millionths of an inch for roundness and size.

SOLID SQUARE MASTER GAGE BLOCKS



Use Van Keuren Solid Square Master Gage Blocks—6 times ordinary life.

FUSED QUARTZ OPTICAL FLATS



Finished Fused Quartz Optical Flat and rough blank

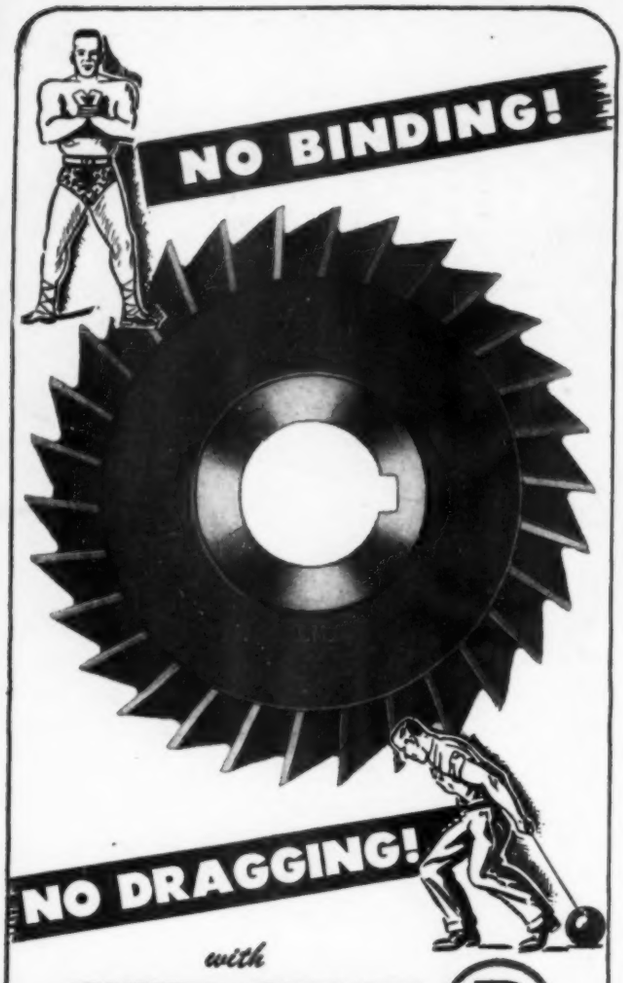
A Van Keuren Fused Quartz Optical Flat is a beautiful piece of work embodying the best in workmanship and accuracy.

Fused quartz is highly transparent and has exceptional wearing qualities. The expansion and contraction due to temperature change is 1/16" that of plate glass and 1/6" that of pyrex.

Specify Van Keuren, Double Surface Fused Quartz Optical Flats for checking flatness of precision tapped parts, maintenance of amplifying gages, and control of gage block wear. They are the most economical to purchase and the most accurate to use.

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages Wire Type Plug Gages • Measuring Wires Thread Measuring Wires • Gear Measuring System • Shop Triangles.

T. WATERTOWN, MASS.

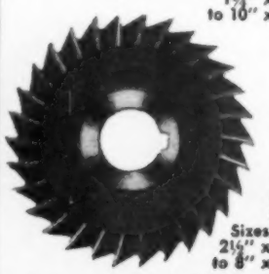


with

CIRCLE R

METAL SLITTING SAWS

HOLLOW GROUND SAW
Sizes from 1¼" x 1/32" to 10" x 9/210"



SIDE CHIP SAW
Sizes from 2½" x 1/16" to 8" x 9/210"

Here are two types of slitting saws for regular and heavy feed duty. The Circle R side chip slitting saw in particular is designed to take deep cuts, split chips and eliminate dragging. With all Circle R saws, in all sizes, there is no binding, no dragging.

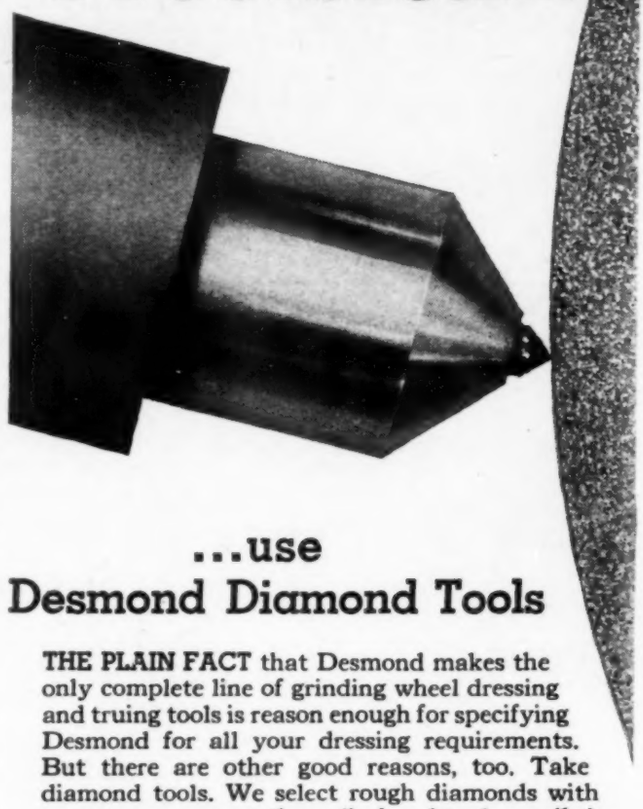
For complete details and specifications on these and other Circular Saws, send for our Catalog L.

CIRCULAR TOOL CO., INC.

PROVIDENCE 5, R. I.

CHICAGO PHILADELPHIA NEW YORK DAYTON CLEVELAND
LOS ANGELES ROCHESTER INDIANAPOLIS DETROIT ST LOUIS

For Utmost Precision...



...use Desmond Diamond Tools

THE PLAIN FACT that Desmond makes the only complete line of grinding wheel dressing and truing tools is reason enough for specifying Desmond for all your dressing requirements. But there are other good reasons, too. Take diamond tools. We select rough diamonds with expert care, mount them (in hand tools or nibs) with hard-earned know-how, and *stand behind every single one.*

Fasten your Desmond diamond tools securely in the tool post or holder . . . with the tool axis at an angle of 10 to 15 degrees with respect to the radius . . . and turn the tool frequently to present a new diamond point. As a rule large diamonds run cooler and *do more work per dollar* than small ones.

Write for your copy of the Desmond Catalog No. 45 today. It will help you pick the right tool for the job—and get the most out of it.

THE DESMOND-STEPHAN MFG. CO., URBANA, OHIO

Desmond

the only complete line of grinding wheel

DRESSERS & CUTTERS

BALL BEARING DRESSERS | REVOLVING CUTTER TYPE DRESSERS | DIAMOND HAND TOOLS AND NIBS | WHEEL TYPE DRESSERS | SIMPLEX STEEL-SLIDE VISES

Mechanical Division
General Mills, Inc.
1620 CENTRAL AVE. • MINNEAPOLIS 13, MINN.

One of America's finest machine shops offers you complete production facilities

The Mechanical Division of General Mills is a completely staffed industrial production organization. It is equipped with a million and a half dollars worth of new machines and production tools—in a modern, 350,000 square foot plant.

HERE'S WHAT WE'D LIKE TO DO FOR YOU

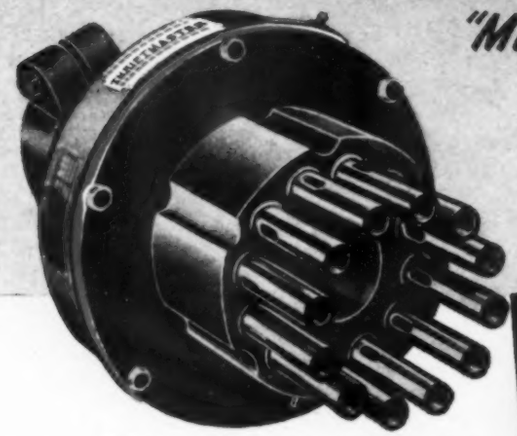
We have ample production capacity available to you now—immediately—to manufacture complete mechanical assemblies on a job contract basis...to give you the production you need...to help you get your products to your market faster.

A letter, wire or telephone call will start the ball rolling. Tell us what you need. If blueprints and specifications are available, we'd like to see them. Maybe a sample will do even better. If you'd like to have a meeting with one of our representatives, just let us know—he'll be there whenever you want him.

Remember—we're ready to go to work for you *now*. How soon do you want us to start? Meanwhile let us send you a copy of our booklet which shows some of the jobs we've done and some of the machines and tools we use to do them.

FULL BALL BEARING CONSTRUCTION

"Multiple Barreled" Profit Makers



12 Spindles on fixed centers. *For Drilling, Tapping, Reaming, Counter-sinking, End Milling, Spot Facing, Hollow Milling.*

Special *fixed-center* THRIFTMASTER Drillheads to your blueprints. Standard Adjustable Drillheads are the popular 2- to 6-spindle in capacities to 1½" drills. Recommendations for standard or special drillheads made promptly and without obligation.

FIXED CENTER and STANDARD ADJUSTABLE

Drillheads

THRIFTMASTER

Reps. in
CHICAGO.....Gatz-Arnold Co., 1553 West Madison Street
CLEVELAND.....T. J. Fraser Tool & Supply Co., 13413 Euclid Avenue
PITTSBURGH.....Voss Machinery Co., 2882 West Liberty Avenue
BOSTON.....A. R. Shevlin Co., 258 Park Square Building
DETROIT.....B. E. Parish Co., 3340 Fenkell Avenue
• Dealers in most cities •

THRIFTMASTER PRODUCTS DIVISION *THOMSON INDUSTRIES, INC.*
29-05 Review Avenue, Long Island City 1, New York

NOW! HEXAGON AND SQUARE

Precision Collets

24 HOUR DELIVERY!

FOR ATLAS • LOGAN • SOUTH BEND
SHELDON • HARDINGE • CLAUSING
ELGIN • CRAFTSMAN LATHES, ETC.
BROWN & SHARPE MACHINES AND
MANY COLLET CHUCK ATTACHMENTS

HEX OR SQUARE Collets needed for that new job? Then say "*PRECISION Collets, please!*" to your industrial distributor. You'll get them now when you want them . . . from stock. And you'll get them as you want them . . . ground dead true, with a spring temper that spells assured performance, and with long life guaranteed.

PRECISION Collets fitting most popular machines and attachments are stocked in ROUND, HEXAGON and SQUARE sizes. Order them from leading distributors thruout the country, who serve industry well.

Our new catalog of PRECISION Collets and Lathe Attachments is ready — Write for it!

KASSON ENTERPRISE

GENERAL DIE AND STAMPING COMPANY
262-272 MOTT STREET • NEW YORK 12, N. Y.

when you want Speed-
when you want power-

. . . in your job of grinding, polishing, buffing, sanding, drilling, reaming, screw-driving or nut-setting, you want a Strand Flexible Shaft machine, because a Strand will do it faster, better, and stand up to it longer.

Strand Flexible Shaft machines provide constant speeds with greater operator convenience. Hundreds of attachments easily interchanged — 125 types and sizes — models include vertical and horizontal type machines from ⅛ to 3 h.p. Distributors in all principal cities.

M-5

Send today for catalog showing complete line

Strand FLEXIBLE SHAFTS — PULLEYS

N. A. STRAND & CO.
5009 NO. WOLCOTT AVE.
CHICAGO 40, ILL.

STANDARD ENGINEERS NOTEBOOK

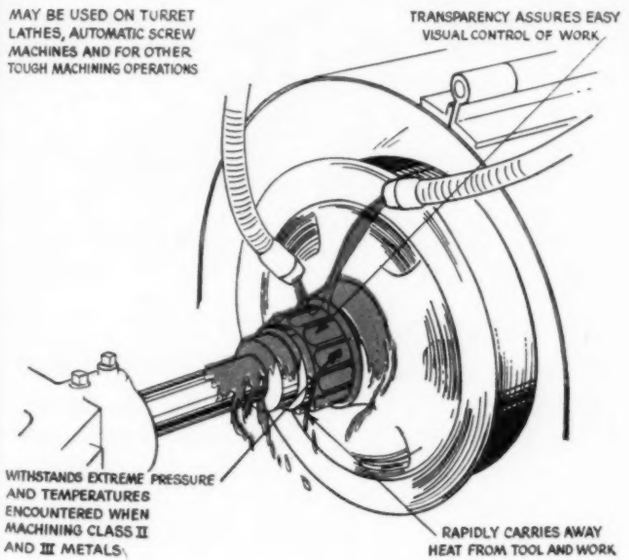
CALOL RPM

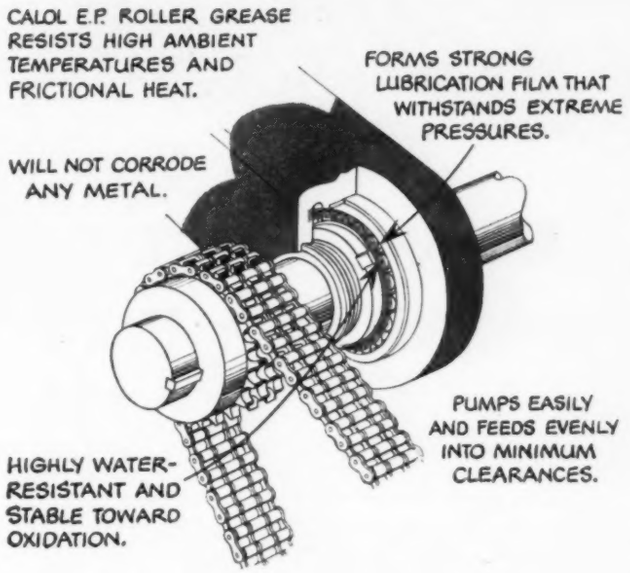
Potent cutting oil produces good surface finish

When machining Class II or Class III metals many operators have found the high lubricating value and extreme pressure quality of Calol Cutting Oil—20TA ideal for producing the desired finish. Because it is transparent, Calol Cutting Oil—20TA affords a machine operator complete visual control of work.

This special cutting oil is made from highly refined oils and compounds which give it unusual potency and transparency. It is an excellent coolant —carries heat away rapidly from tools and gives them longer service life.

Recommended for tough work, Calol Cutting Oil—20TA is used on turret lathes, automatic screw machines, etc. It can be used when machining brass or bronze where slight staining is not objectionable and work is cleaned or pickled after machining.


MAY BE USED ON TURRET LATHES, AUTOMATIC SCREW MACHINES AND FOR OTHER TOUGH MACHINING OPERATIONS
TRANSPARENCY ASSURES EASY VISUAL CONTROL OF WORK
WITHSTANDS EXTREME PRESSURE AND TEMPERATURES ENCOUNTERED WHEN MACHINING CLASS II AND III METALS
RAPIDLY CARRIES AWAY HEAT FROM TOOL AND WORK


CALOL E.P. ROLLER GREASE RESISTS HIGH AMBIENT TEMPERATURES AND FRICTIONAL HEAT.
FORMS STRONG LUBRICATION FILM THAT WITHSTANDS EXTREME PRESSURES.
WILL NOT CORRODE ANY METAL.
PUMPS EASILY AND FEEDS EVENLY INTO MINIMUM CLEARANCES.
HIGHLY WATER-RESISTANT AND STABLE TOWARD OXIDATION.

Special grease carries heavy-duty loads

When any type of heavy-duty, grease-lubricated ball or roller bearings are subjected to extreme pressures, high temperatures, or moisture, Calol E.P. Roller Grease will solve the severe lubrication problems. It was originally developed for anti-friction roll neck bearings in steel mills, but is used with complete satisfaction on heavy-duty anti-friction bearings in many other plants.

Calol E.P. Roller Grease is made from heavy bodied oil and special soap stocks wherein are incorporated extreme pressure additives. It is very cohesive and stable. Its tough film withstands both shock loads and pressures far higher than other greases used on anti-friction bearings.

Fully moisture resistant, Calol E.P. Roller Grease resists oxidation, is non-injurious to bearing metals, and handles easily in grease pressure systems at low temperatures.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Colo.; Standard Oil Company of Texas, El Paso, Texas.

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

HOW TO PUT A MAILED FIST INTO A *VELVET* GLOVE!

Valuable, work-wise hands are the flesh, bone and *skin* of industry.

Help keep them busy.

Take no chances with the surface *skin* especially.

Guard this skin against the annoying and profit-eating effects of industrial dermatitis due to specific skin irritants, such as chemicals and other materials.

Give it a *gentle glove of advance protection* with West Protective Creams.

Professional medical advice has determined that West Protective Creams are compounded with scientific accuracy to protect exposed skin areas to the fullest possible extent.

West Creams fall into six distinct types . . . and depending on the need, they supply either "skin surface" or "skin-penetrating" protection against every major specific irritant to which the human skin is sensitive.

West Protective Creams comprise part of a large list of "skin safeguards" developed in the West laboratories.

One of West's 350 technical safety consultants throughout the country will be glad to help solve your dermatitis problems.

Products That Promote Sanitation

WEST Disinfecting Company

42-16 WEST STREET
LONG ISLAND CITY 1, N. Y.

★ BRANCHES IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

CLEANSING DISINFECTANTS • INSECTICIDES • KOTEX VENDING MACHINES
PAPER TOWELS • AUTOMATIC DEODORIZING APPLIANCES • LIQUID SOAPS

WILSON *Announces the New Long-Range Model "TUKON" Tester*

for both

MICROMETRIC MACROMETRIC Hardness Testing

. . . with choice of loads from 25 to 50,000 grams

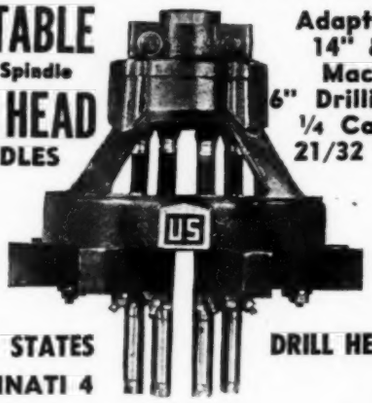
A valuable instrument for those whose requirements range from extreme light load testing (with Knoop Indenter) to heavy load testing (with 136° Diamond Pyramid Indenter). For complete details, send for our Bulletin TK-46.

TUKON TESTER *for* KNOOP and 136° PYRAMID HARDNESS NUMBERS

WILSON MECHANICAL INSTRUMENT CO., INC.
AN ASSOCIATE COMPANY OF AMERICAN CHAIN & CABLE COMPANY, INC.
230-B PARK AVENUE, NEW YORK 17, N. Y.

ACCO

ADJUSTABLE Multiple Spindle DRILL HEAD 8 SPINDLES



Adaptable to 14" & 17" Machines
6" Drilling Area
¼ Capacity
21/32 Centers

UNITED STATES DRILL HEAD CO.
CINCINNATI 4 OHIO

HARDNESS TESTER

The *Scleroscope* is the only hardness tester that takes in the entire range from the softest to the hardest metals without any adjustments.

MODEL D-1 DIAL TYPE
Write for Circular!

THE SHORE INSTRUMENT & MANUFACTURING CO., INC.
9025 VAN WYCK AVENUE
JAMAICA, NEW YORK
TELEPHONE: JAMAICA 6-4090

Double Duty DEPARTMENT

TO BETTER SERVE *You*

The order department at Detroit Broach is the production control department, too. Thus if it should be necessary to call Detroit Broach regarding an order, the customer talks directly to the department responsible for the processing of that order—the department that actually schedules and follows up production. By this means the order department has the complete data on all production, first hand, at all times.

Such efficiency is the keynote of all Detroit Broach services . . . machine selection and adaptation, process and tool engineering, tool and fixture manufacture, and job set-up and try-out. The complete broach service—combined with unexcelled facilities and extensive experience on all types of broaching applications and broaching machines.

Next time call Detroit Broach . . . for prompt, efficient service and for greatest broaching economy.

BROACHING TOOL INSTITUTE

DETROIT *Broach* COMPANY

20201 SHERWOOD AVENUE • DETROIT 12, MICHIGAN

APEX BITS: the most complete line

For Phillips, Slotted Head, and Clutch Head Screws

Hand drivers for Phillips and clutch head screws.

• • •

Bits for practically every make of power driver; point sizes for all screws; two degrees of hardness to serve exact requirements of both standard (soft) and self-tapping screws.

• • •

Exclusive reconditioning service restores your used Phillips bits to original efficiency at a fraction of the cost of new bits. Insert-type Phillips bits provide bit holders and insert tips you can discard as they wear out.

WRITE FOR THESE CATALOGS

Apex-Phillips standard power bits and hand drivers.....**Catalog No. 15**

Apex-Phillips insert-type power bits and hand drivers.....**Catalog No. 102**

Apex power bits for slotted screws .....**Catalog No. 16**

Apex power bits and hand drivers for clutch head screws.....**Catalog No. 17**

APEX SOCKETS

PLAIN SOCKETS, female square drive, ¼" thru 1".

ADAPTERS, hex drive with male square, ¼" thru ⅜".

ADAPTERS, male and female square drive, ¼" thru 1", short and long.

STRAIGHT WRENCHES, hex drive, ¼" thru ⅜".

STRAIGHT WRENCHES, square drive, ⅜" thru ¾".

ALLEN DRIVERS, female square drive, ⅜", ½", and ¾".

UNIVERSAL SOCKETS, female square drive, ¼" thru 1".

UNIVERSAL ADAPTERS, male and female square drive, ¼" thru 1".

UNIVERSAL WRENCHES, hex drive, ¼" thru ⅜".

UNIVERSAL WRENCHES, female square drive, ⅜" thru ¾".

• • •

You will find the right tool for practically any requirement from the Apex standard line. Write for complete, 105-page illustrated catalog giving full dimensional data and prices. Thousands of items listed. We quote promptly on specials.

APEX Heavy-Duty Universal Joints

FOR AIRCRAFT AND INDUSTRY

Standard sizes from ⅜" to 1½"—larger sizes obtainable up to 4"

Unique structural design and special exclusive flexible cover gives Apex joints highest strength-weight ratio (both axial and torsional), longest wear, least deflection, highest shock resistance and overload capacity. Enable you to save space by using smaller joints. Joints can operate in liquids, corrosive or abrasive conditions, in extremes of temperature.

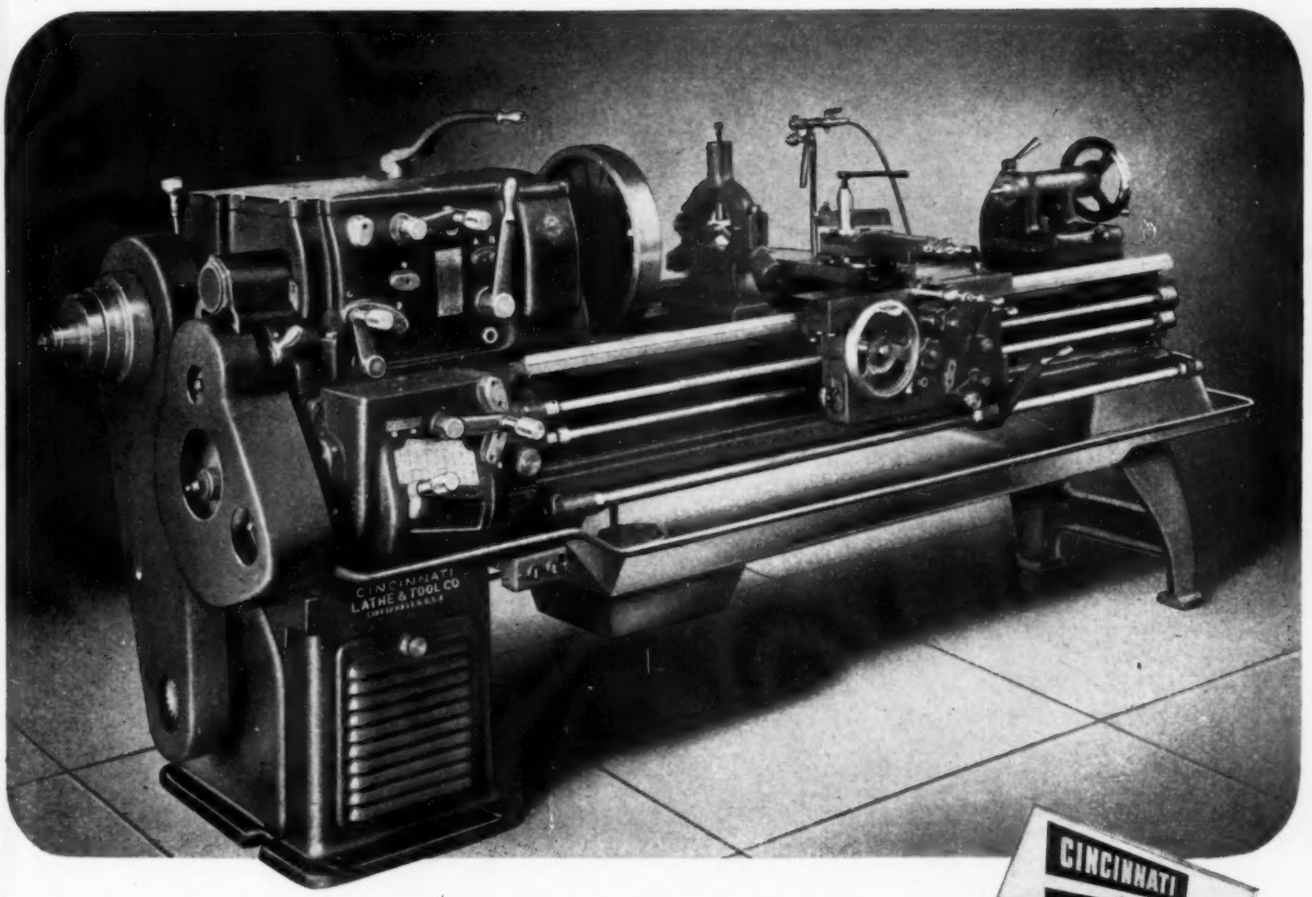
Get these exclusive Apex advantages in your products. Write for complete data in Bulletin 103A and Apex Joint Data Rule.

APEX

THE APEX MACHINE & TOOL CO., 1030 S. Patterson Blvd., Dayton 2, Ohio

Safety Friction Tapping Chucks; Quick Change and Positive Drive Drill Chucks; Vertical Float Tapping Chucks; Parallel Floating Tool Holders; Power Bits for Phillips, Slotted Head and Clutch Head Screws; Hand Drivers for Phillips and Clutch Head Screws; Aircraft and Industrial Universal Joints; Sockets and Universal Joint Socket Wrenches.

OF OUTSTANDING VALUE...



A Cincinnati Lathe is a time-tested lathe—with time-tested features of design—time-tested materials, and built by time-tested manufacturing methods. It is a profit maker for maintenance and repair shops, general machine shops or small manufacturing shops.

We will be glad to furnish you complete data, prices and deliveries.

A simple 3-lever shift gives 32 thread and feed changes. Rapid, easy engagement and disengagement of longitudinal cross feeds. Exclusive design star knobs (accidental operation impossible). Easily read protected chasing dial. Six actual swings from 16½" through 27½". Bed lengths from 6'.

This circular will be sent on your request, and includes complete description and data on the 14", 16", 18", 20", 22", and 24" Cincinnati Lathes.

CINCINNATI LATHE & TOOL CO.

CABLE ADDRESS: CINTILATHE

OAKLEY, CINCINNATI 9, OHIO

KUX

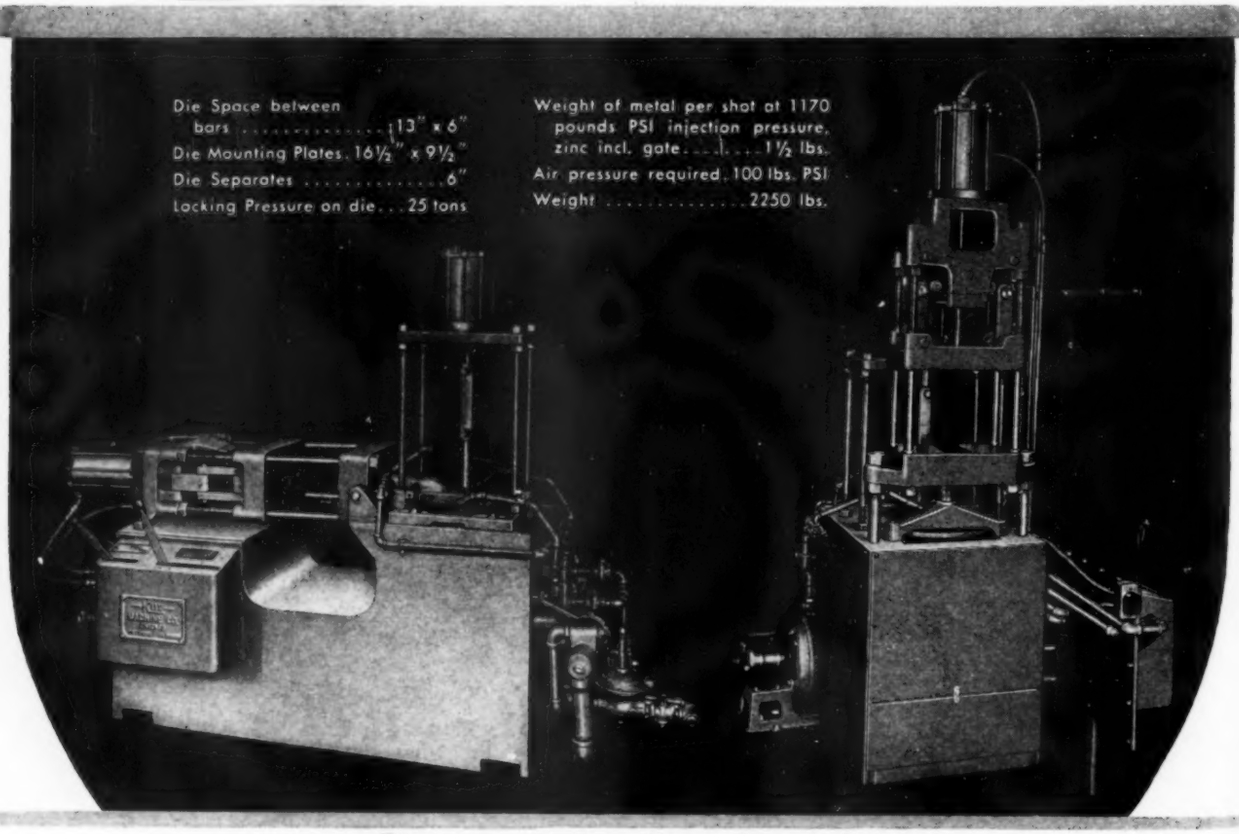
The Mighty MIDGET of Die Casting Machines

THE NEW KUX MODEL K

is the safest, most highly productive small die casting machine on the market! Available in horizontal or vertical center shot models, die castings weighing up to 1½ pounds in zinc are produced under high injection pressures, insuring quality, dense castings with minimum porosity. ***Compare these features:*** Center shot operation with floating nozzle always in seated contact with the die and one-piece gooseneck. Speed and power obtained by use of an air compressor to operate opening and closing of die, and metal injection plunger. Double safety lock, mechanical-electrical, prevents metal shot while die is in open position. Double toggle mechanism locking in two directions absorbs all locking pressures, operates on all four corners of die plate. Built-in ejector plate for positive ejection. Self-contained gas or oil firing unit.

Die Space between bars . . . . . 13" x 6"
Die Mounting Plates . 16½" x 9½"
Die Separates . . . . . 6"
Locking Pressure on die . . . 25 tons

Weight of metal per shot at 1170 pounds PSI injection pressure, zinc incl. gate . . . . . 1½ lbs.
Air pressure required . 100 lbs. PSI
Weight . . . . . 2250 lbs.



Write now for an illustrated folder

KUX MACHINE COMPANY
3922 W. HARRISON STREET • CHICAGO 24, ILLINOIS

SAVE WORK-OPERATIONS BETWEEN GRIND AND BUFF with–

Brightboy

REG. U.S. PAT. OFF.

Combine BURRING, PRECISION FINISHING, CLEANING and POLISHING! *Save* man hours, *improve* product quality. The amazing scope and versatility of Brightboy compounds of RUBBER and various abrasive textures* gives you *outstanding results.*

Get immediate deliveries, methods and applications data and catalog manual from your distributor. Write us on specific problems; a Brightboy service engineer will call at your request.

BRIGHTBOY INDUSTRIAL DIVISION
Weldon Roberts Rubber Co. **Newark 7, N. J.**
Pioneer Developers of Soft Rubber Bonded Abrasives

***BRIGHTBOY STANDARD**
Favorite for burring, finishing and polishing on the widest variety of metals and metal parts.

***BRIGHTBOY TUFF-TEX**
Tougher texture, for finishing hard metals. The tougher binder accents the abrasive action, yet retains the soft rubber cushion, finishing and pre-polishing in one operation.

***BRIGHTBOY FINE-TEX**
Smoother, finer texture for work on softer metals, producing special finishes and for applications where the coarser wheel might not be suitable.

WELDON ROBERTS Brightboy

the **SOFT RUBBER BINDER CUSHIONS** *the Abrasive*

ATTACHMENTS FOR THE HARTFORD SUPER-SPACER *extend its utility . . . . .*

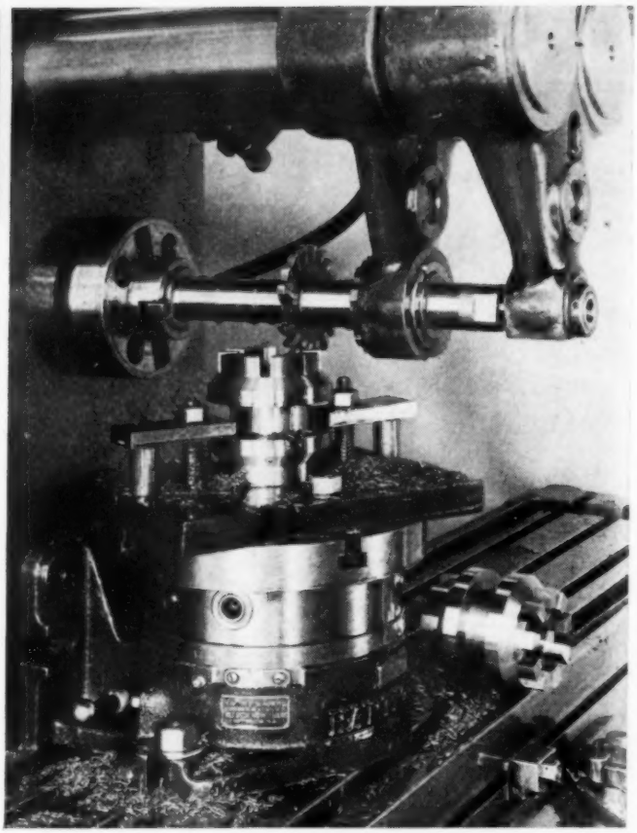
for example: MILLING A DOUBLE END PIECE

The set-up shown here gives an idea of the versatility of this spacing device. Equipped with a face plate on which is mounted a special holding fixture, the Hartford Super-Spacer provides the means of milling and indexing the ends of a double clutch. When operations have been completed on one end of the piece, the part is reversed and the same operations performed on the other end. Indexing is fast, foolproof and positive. Work is securely held during all operations.

A wide variety of attachments have been developed for use with the Super-Spacer. Among those available as standard accessories are attachments for plain and radial drilling. These can be procured direct from "Hartford."

Regardless of the operation, if it involves indexing, it will pay you to explore the possibilities of the Super-Spacer.

Write for literature showing the details of the Hartford Super-Spacer and a few of its many typical applications.



THE HARTFORD SPECIAL MACHINERY COMPANY, Hartford 5, Conn.

ANTON PARALLELS

INCREASE PRODUCTION IMPROVE QUALITY USE ANTON PARALLELS

ANTON PARALLELS FILL A LONG-FELT NEED—Permanently straight and accurate, yet priced for general machine shop use. All parallels fully guaranteed to be within the limits specified. Maximum size tolerance .001 inch on ground sides. Maximum variation in parallelism and straightness within length, .0001. Rockwell "C" hardness 65 up.

ANTON PARALLELS COME IN THREE STANDARD SIZES—

- ¼" Thick x 6" Long—½" to 1-13/16" High in Steps of 1/16" $85.00 per set—22 pairs.
- ½" Thick x 6" Long 1-3/16" to 1-13/16" High in Steps of 1/16" $71.00 per set—11 pairs. $106.00 per set of 11—3 each size.
- ¾" Thick x 6" Long—1-3/16" to 1-13/16" High in Steps of 1/16" $88.75 per set—11 pairs.

Price per set includes a handy Wooden Container. Large Stock of Single Pairs also Available. All Prices are F.O.B. New York

ANTON MACHINE WORKS

52 Sands St. Tel. TR. 5-8092 Brooklyn 1, N. Y.

DEALERS: Morris Abrams, 196 Centre St., New York 13, N. Y.; Arrow Machine Tool Co., Inc., 251 Richmond St., Providence, R. I.; Barwood Co., 3137 N. 15th St., Philadelphia, Pa.; Hansen & Hasle, 135 Myrtle Ave., Brooklyn 1, N. Y.; Toolskill Co., 55 E. Washington St., Chicago 2, Ill.

Just ONE setting per form
Just ONE continuous motion

"Fluidmotion"*

FEATURES:

.0001" accuracy • Automatic Centering • "Fluidmotion" dressing • Dustproof and shatterless • hardened stainless steel • 7" & 14" wheel capacities • Highest quality diamonds.

Prominent users tell us that they consider "Fluidmotion" Radii & Angle Dressers the finest precision dressing instruments procurable—regardless of cost. They obtain greater accuracy, longer wheel life, and much faster setup and operation.

We'll be glad to send you complete information. Write

*Reg. U. S. Pat. Off.

J&S TOOL CO. 477 Main St. East Orange 1, N. J.

Representatives in Principal Cities

CRAFTS DIAMOND TOOLS

Consistent Quality

CARBIDE-TIPPED MACHINE SHOP GAGES AND TOOLS

ARTHUR A. CRAFTS CO., INC.
603 NEWBURY ST., BOSTON 15, MASS.
PLANTS: CHICAGO, DETROIT, BOSTON

THE CHOICE OF "CRITICAL" MANUFACTURERS . . . .

Gorham

HIGH SPEED STEEL TOOL Bits

GORHAM STANDARD
FOR THE COMMERCIAL FIELD

GORHAM M-40-B
FOR HEAVY CUTS IN HARD MATERIAL

GORHAM GORMET
FOR MORE ABRASIVE MATERIALS

The day of haphazard selection of products is passing. Buyers are becoming increasingly critical of what is offered them. Just "any cutting tool" won't do. ★ ★ That is why more and more manufacturers are turning to GORHAM High Speed Steel Tool Bits . . . a product that has proved itself through the war years and long before. GORHAM Tool Bits meet the most exacting requirements of tough production jobs. In thousands of plants, they are setting new standards of performance on difficult and intricate work. ★ ★ Try GORHAM High Speed Steel Tool Bits in *your* plant today. Learn why these specially designed tools do the job better, cheaper, faster. Immediate delivery—place your order now.

GORHAM TOOL CO. • 14400 WOODROW WILSON • DETROIT 5, MICHIGAN

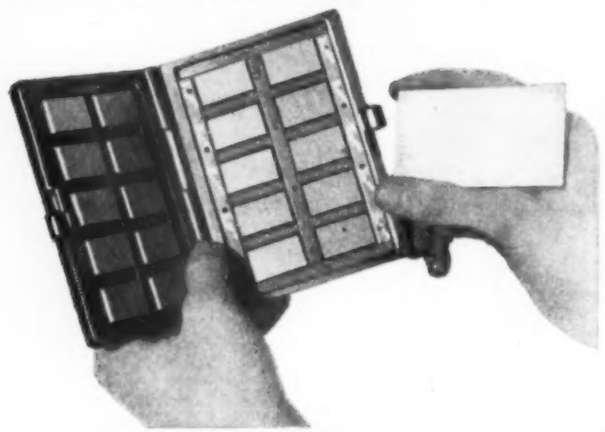
EDWARD

Blake

COMPANY

634 COMMONWEALTH AVE., NEWTON CENTRE 59, MASS.

BE POSITIVE SURFACE FINISHES ARE "AS SPECIFIED" . . .



USE MACHINE-CUT SPECIMENS AS STANDARDS

We are pleased to announce another Blake product of precision and quality—Machine-Cut Surface Finish Standards that give operators and inspectors a fast, accurate, inexpensive check of surface finishes. This method of inspecting surface finish is based on the well-known sensitivity of the fingernail, which can detect the most minute differences in the roughness of a surface. By simply drawing a fingernail over the work—then over the specified *Machine-Cut Surface Standard*—you can instantly determine whether or not the finish produced is within the limit specified.

The twenty stainless steel Standard Blocks are accurately machined to pre-determined roughness values, then checked on a Profilometer. The set ranges from 2 mu (micro-inches) polish to 500 mu turn, in accordance with the Preferred Number Series recommended by the A.S.M.E.

Manufactured by University Machine Co., Cambridge, Mass., a Division of Baird Associates, Machine-Cut Surface Standards are made in exactly the same manner as the larger master specimens furnished during the past few years to Army and Navy Ordnance plants and to private industry. These are actually *MACHINE-CUT* Standards—not replicas—therefore they give a *true* comparison of the specimen and the work. Several thousand sets are now in use throughout the world

Each specimen is marked with its roughness value and mounted in a lightweight, pocket-size, folding case, made of a die-cast magnesium alloy. The Set is ready for instant use—by the operator, inspector, foreman, buyer, etc. Because Machine-Cut Surface Finish Standards maintain their characteristics indefinitely, you'll always be suer that the surface finishes you produce are "as specified". *Send the coupon today for complete details.*

Please send me Bulletin No. 1046 on Machine-Cut Surface Finish Standards. A.M.

NAME_____ TITLE_____

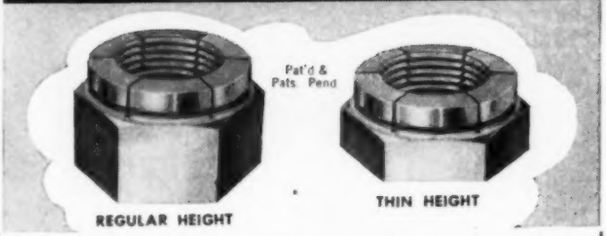
COMPANY_____

STREET_____

CITY_____ STATE_____

BLAKE TAP GRINDERS—FILTAIRE PORTABLE DUST COLLECTORS—AMERICAN TOOL HOLDERS—BLACK DIAMOND PRECISION DRILL GRINDERS—WALTHAM CUTTER SHARPENERS

FLEXLOC



SELF-LOCKING NUTS

CAN YOU BE SURE THAT A PLAIN NUT WON'T SLYLY UNWIND ITSELF? If not, then what you need is the All-metal, One-piece "Flexloc," which is a Self-Locking Nut that won't budge, except when a wrench is used.

"Flexloc" packs maximum usefulness in minimum space because it is rugged, locked, compact—and is therefore, becoming increasingly popular and this applies alike to U.S.S. and S.A.E. thread series. Every thread—including the locking threads—takes its share of the load.

Covers a wide range of tolerances—from low #1 to high #3. Can be used over and over again without losing much of its locking ability.

Being a "stop" nut, it stays locked in any position on a threaded member.

"Flexloc" Thin Nuts are especially popular, because their tensile is so high.

Sizes from #6 to 1" in diameter—millions in use!

Convince yourself with a few free samples

OVER 43 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN, PA. BOX 4

BOSTON • CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • SAN FRANCISCO

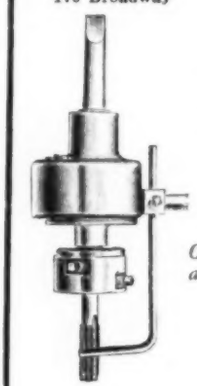
ERRINGTON MECHANICAL LABORATORY

TAPPING CHUCKS

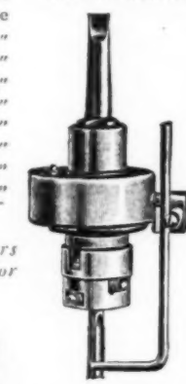
STAPLETON, STATEN ISLAND 4, N. Y.

NEW YORK
170 Broadway

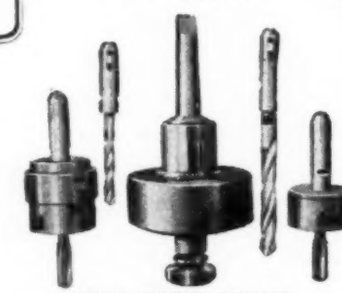
CHICAGO
6701 N. Sioux Ave.



Size	Taps Exact Size
No. 00 H.S.	Up to ¼"
" 00	5/16"
" 0	3/8"
" 1	7/16"
" 2	1/2"
" 3	5/8"
" 4	3/4"
" 5	1"



Our High Speed Tappers are Super-Sensitive for Small Tapping



Style B Positive Stop Holds Work Down

Style C Graduated Adjustable Safety Friction

DRILL PRESS TURRET

Style D-E with Quick-Change Tool Holders to Drill, Tap and Set studs, etc., without moving work, or stopping or reversing machine. Individual friction adjustment in each tapholder. If required.

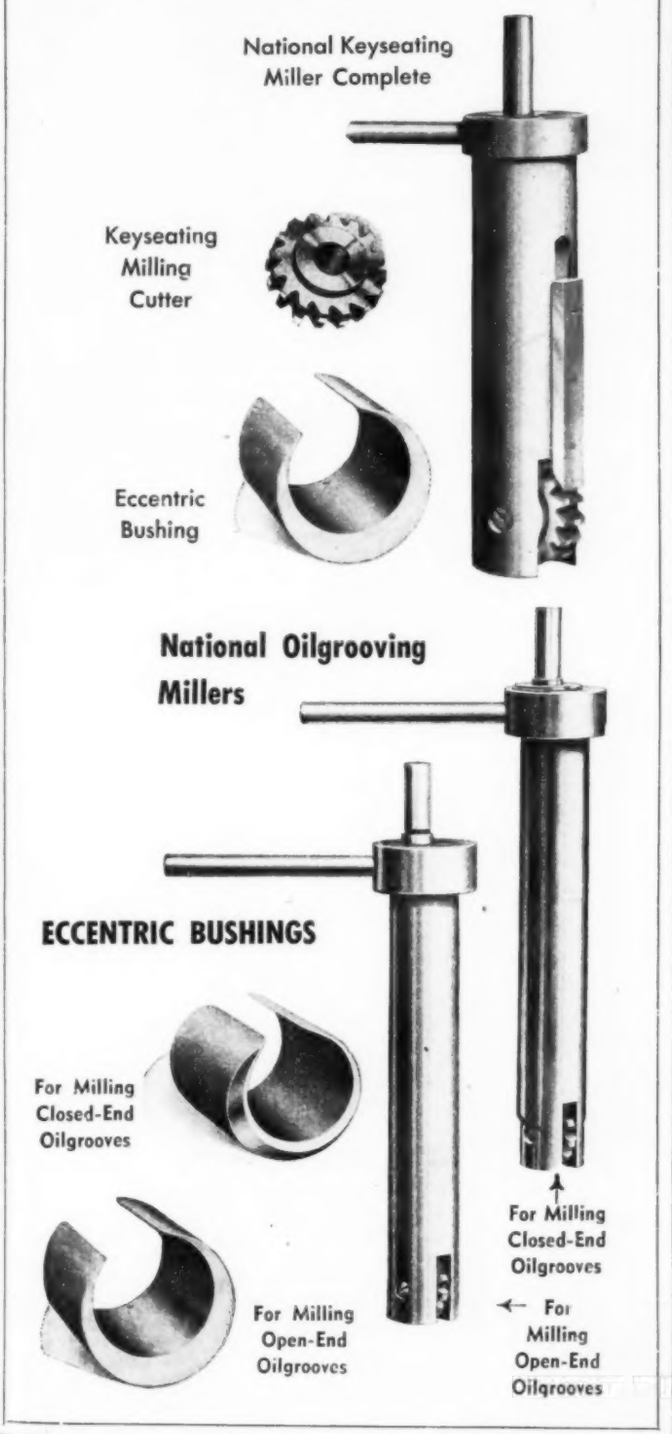
Also, Opening Die-Heads; Opening Stud-Setters; Friction Screw-Drivers and Nut-Setters, etc.

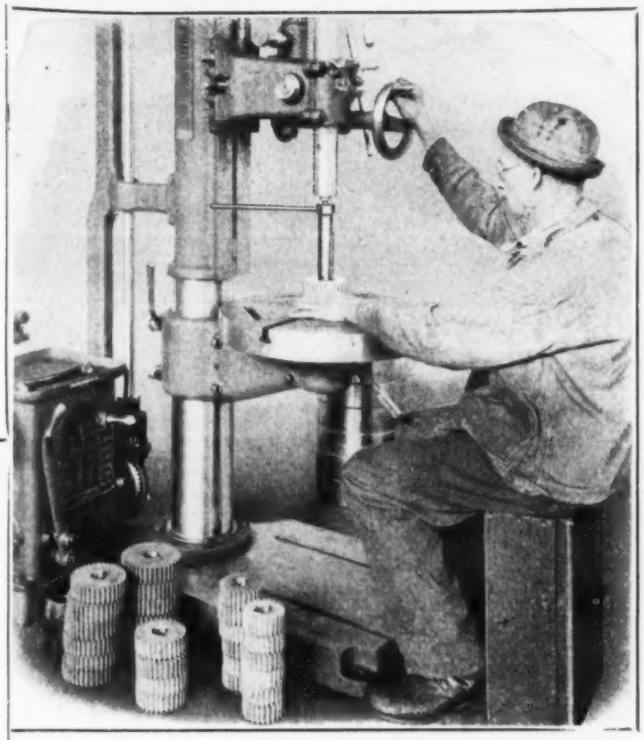
NATIONAL

Keyseating and Oilgrooving

MILLERS

on review





Milling Internal Keyseat in Spur Gears

● Illustrated are two types of standard design National Millers for keyseating and oilgrooving operations. Also shown are a few accessory parts used to facilitate operations.

The keyseaters are stocked in 1/2" to 3 1/2" diameters for cutting lengths from 1 7/8" to 12". Oilgrooving millers are stocked in diameters from 5/8" to 1 1/2" for cutting lengths from 3" to 8 1/2". Also available are keyseating millers for cutting multiple internal keyseats in gears and other parts requiring multiple keyseats.

It is also possible to use both the keyseating and oilgrooving millers in bores larger than the miller's own diameter by using eccentric bushings, which are stocked for customers' convenience.

Special keyseating millers developed to meet specific job requirements can also be furnished by National from samples of your work or B.P.

National keyseating millers are adaptable to drill presses, radial drills and horizontal mills for milling keyseats in work too large or bulky for conventional keyseating machines.

National keyseating millers finish a keyseat in one cut—provide keyseats with parallel sides—mill keyseats in offset holes—mill keyseats without clamping the work, and offer many other time and cost saving advantages.

Consult NATIONAL

Machine Tool Co. on your keyseating and oilgrooving problems. Catalog 16 contains complete data on application—sizes stocked—and other pertinent facts on keyseating operations. Write for your copy today.

NATIONAL MACHINE TOOL CO.

CINCINNATI, OHIO

FACTS YOU SHOULD KNOW ABOUT ELECTRODES

Are you familiar with the mechanical properties of electrodes? . . . Do you know the different types of electrodes for welding cast iron — mild steel—high tensile, low alloy steels . . . which electrode will do the job better, faster — at less cost?

This, and other vital information is all contained in Airco Catalog No. 120. Compiled by leading technicians in the field, this definitive work gives authentic, understandable information on electrodes . . . application, welding procedure, mechanical properties and specifications are thoroughly covered.

Every metal man will find almost daily use for this big, helpful manual. It will save him time, effort and needless worry. It will answer almost any question regarding the proper electrode for welding any particular base metal — for any given type of work.

Send for this valuable, informative guide today! Just fill in the coupon, and mail it to: Air Reduction, General Offices, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

AM

AIR REDUCTION
60 E. 42nd Street
New York 17, N. Y.

Please send me a copy of Catalog 120.

Firm_____

Name_____

Address_____

City_____ Zone____ State____

AIRCO AIR REDUCTION

Offices in All Principal Cities

HEADQUARTERS FOR OXYGEN, ACETYLENE, AND OTHER GASES...CARBIDE...GAS WELDING AND CUTTING APPARATUS AND SUPPLIES . . . ARC WELDERS, ELECTRODES AND ACCESSORIES

INCREASE *Production*...
DECREASE UNNECESSARY HEADACHES BY ORDERING
CARBIDE-TIPPED TOOLS *with* HIGH-SPEED STEEL BODIES

The most efficient tools are brazed with carbide tips on hardened high-speed steel bodies, so that the total length of the flutes and pilots Rockwell C-62-63.

It has also been proven in actual practice that this type of tool has a higher cutting efficiency due to the harder background for the carbide tips which produces less spring back under heavy cuts for this same reason. Also, the flutes and pilots will not score or pick-up due to the hardness of the high-speed steel and long wear on the pilot.

If you have a cutting tool problem, DETROIT REAMER & TOOL COMPANY would appreciate an opportunity to work it out with you.

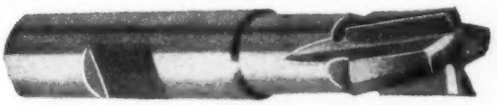
Write for QUOTATION

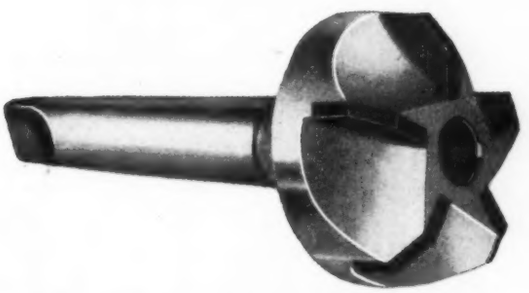
• MADE TO YOUR SPECIFICATIONS •

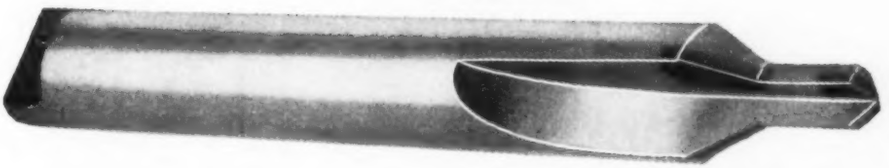
DETROIT REAMER & TOOL CO.

2830 E. Seven Mile Road — Detroit 12, Michigan

Manufacturers of Oil-Hole Drills, Subland Drills, Special Reamers, Circularity Relieved Reamers, End Mills and Special Tools

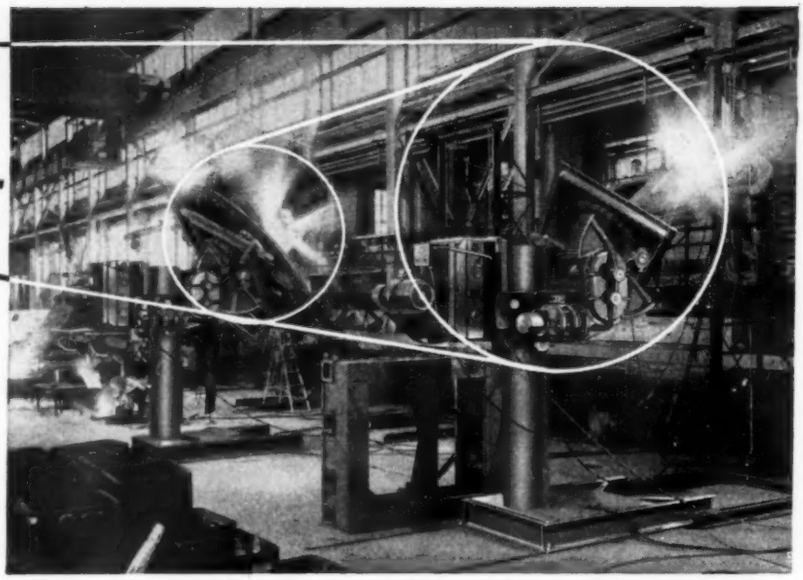






SUBLAND REAMERS
•
LINE REAMERS
•
CENTER DRILLS
•
COUNTERBORES
•
CORE DRILLS
•
END MILLS
•
Special Tools To Your Specifications

More WELDING going on here.....



More welding and less time spent in flopping, propping up and crawling around weldments is the end result of the C-F Positioners in this welding department.

Mounted on C-F Welding Positioners, weldments can be quickly brought into position for a downhand pass—better, more uniform welds with resulting economies and production increases follow. Weldors spend more time welding when they work with C-F Positioners because one "setup" on the table allows them to maneuver the job, without assistance whether hand or power operated Positioners are used.

Power operated, variable speed C-F Positioners, with table rotation speeds in any range from 0 RPM and up, coupled with table tilt to 135° from the horizontal make them the logical choice for any production welding operation. Like all C-F Positioners, they have drilled tables for easy set-ups or tables can be quickly removed for installation of special fixtures or jigs. *Write for Bulletin WP 22.*

CULLEN-FRIESTEDT CO., 1313 S. Kilbourn Avenue, Chicago, Illinois

C-F positioned welds mean better, more economical welds

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

Giant KEYSEATERS

For cutting internal keyways, slots or splines 1/10" to 4" wide and up to 60" long. Fast—Accurate—Flexible. Write for particulars and catalog on machine for your work.

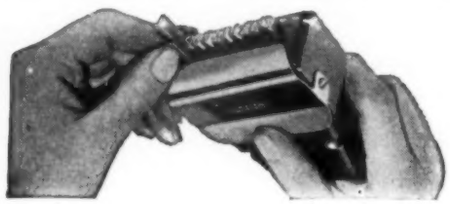
MITTS & MERRILL
913 Tilden St.
Saginaw, Michigan

LUERS Patented Cutting Off Tool Holders
Patented Cutting Off Blades

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured By
J. Milton Luers — 12 Pine St. — Mt. Clemens, Mich.
Produced under License Issued by John Milton Luers Patents Inc.

MARK THE FAST WAY

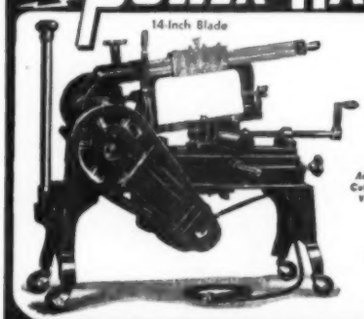


WRITE FOR LITERATURE AND PRICES OF LATEST
HERCULES HOLDERS & TYPE

The ACROMARK Company

7-13 MORRELL ST., ELIZABETH 4, N. J.

POWER HACK SAW



LOW PRICED
SELF-CONTAINED
PORTABLE STURDY
READY TO WORK
ECONOMICAL
EXPORT DEPT.
1111 SO. FERRY BLD'G.
NEW YORK 4, N.Y.

WRITE FOR BULLETIN NO. 400

MILLER-KNUTH MFG. CO. OMAHA, NEB.

No. 3 Littell Reel. Capacity. 300 lbs.

Reel-Off Coil Stock Faster at Less Cost with LITTELL REELS

COIL feeding with LITTELL Automatic Centering Reels increases production, lessens waste, improves quality, loads easier. Littell Reels are made in plain or motor-driven types for handling coils 100 to 20,000 lbs. Littell also makes Roll Feeds, Straighteners, Safety Feeders, etc.

Send for Bulletins

F. J. LITTELL MACHINE CO.
4169 Ravenswood Ave.
Chicago 13, Ill.

San Bernardino, Calif.,
August 11, 1946.

The Cushman Chuck Co.,
Hartford,
Connecticut.

Gentlemen:

It occurred to me that you might be interested in one of your chucks which I have.

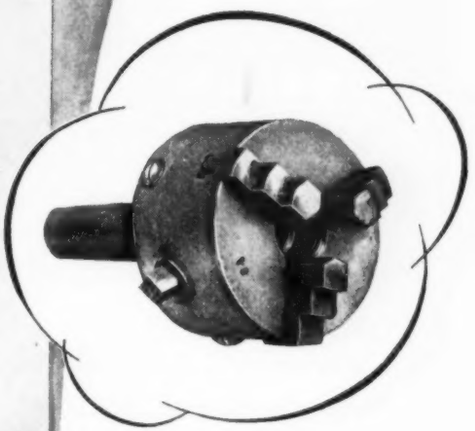
This chuck belonged to my grandfather and then to my father. My grandfather was past eighty when he died 37 years ago. My father had a gun store and repair shop about 70 years ago and used it there. It is still in perfect condition. It has the name CUSHMAN and No. 24. No doubt your records will show when it was made.

Do you know any of your chucks as old as this that are still in use?

I am a machinist employed by the Santa Fe R.R. and have this chuck on a little lathe in my workshop at home.

Yours truly,

F. W. Davis



UNRETOUCHED PHOTOGRAPH.
CHUCK MADE ABOUT 1878.

A Tribute to American Craftsmen

Naturally we were proud to hear of this Cushman Chuck which has faithfully served no less than three generations of machinists . . . and is still going strong. But what we like best about this letter is something written between the lines . . . a story of family pride in fine craftsmanship and fine tools which is a fortunate American heritage.

Consult CUSHMAN

Chucking Engineers Since 1862

THE CUSHMAN CHUCK CO.
Hartford 2, Conn.

FOR THE *Best* SOLDERING JOB USE THE *Best* FLUX

KESTER FLUXES

Photo courtesy General Electric X-Ray Corporation

• The best flux for any soldering job is the right flux. And Kester has the right flux for you.

• Nearly half a century of solder experience has resulted in the development by Kester of hundreds of flux formulas. Extensive testing—both in the laboratory and in the plant—provides Kester with complete knowledge of the performance of each flux. The circumstances under which each flux may best be used have been accurately determined.

• Sweating operations—delicate dip-soldered electrical connections—all kinds of seaming—for any type of soldering job, there's a right and specific Kester flux to assure you of tight, trouble-free solder bonds.

• Consult Kester engineers whenever you have solder problems. At no obligation to you, they'll gladly recommend the right flux formula to insure the best results from any operation.

KESTER SOLDER COMPANY
4223 Wrightwood Avenue, Chicago 39, Ill.
Eastern Plant: Newark, N. J.
Canadian Plant: Brantford, Ont.

KESTER
Solder Fluxes
STANDARD FOR INDUSTRY

SHELDON

New
TRB—S56
Precision
Lathe
$1000.00

MORE ACCURACY, MOST LATHE PER $

No other moderate priced lathe and but a few of the most expensive, have the "Zero Precision" tapered roller spindle bearings, have beds and ways on lead screws held to such close tolerances. In standard quality tool features, no other lathe can offer as much capacity, utility, and convenience per dollar, as you get in the new Sheldon TRB-S56.

This 11¼" swing, 1" collet capacity, 56" bed precision lathe comes with full quick change gears, a full double walled apron with power longitudinal and cross feeds, 8 spindle speeds (35-1350 r.p.m.) and a fully enclosed double V-Belt underneath motor drive, mounted on a modern welded steel bench, complete, less motor for $1000.00 f.o.b. Chicago.

Write for "TRB" Circular.

SHELDON MACHINE CO. Inc.
Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
4258 N. KNOX AVENUE • CHICAGO 41, ILLINOIS, U. S. A.

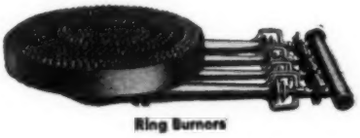
BUZZER Gas BURNERS
Reg. U.S. Pat. Off.

For Many Industrial Gas Uses

NO BLOWER or POWER NECESSARY
. . . just connect to gas supply

Pipe Burners

Nozzle Burners


Ring Burners

Designed to solve numerous Industrial Gas applications, "BUZZER" Burners are unexcelled for Efficiency, Economy, Simplicity and Flexibility. Large variety of models available.

Send for the "BUZZER" Catalog showing complete line of Industrial Gas Burners, Furnaces and other equipment.

CHARLES A. HONES, INC.
121 So. Grand Ave. Baldwin, L. I., N. Y.

ARE YOU REORDERING OBSOLETE BROACHES?

A broach performing satisfactorily right *now* can often be redesigned to increase production, improve finish and eliminate operations.

The above *redesigned* broach did just this. Now it produces the 1″ hole in an aluminum casting to a 10 micro-inch mirror finish. Eliminates reaming, grinding and honing.

Let us check your prints for up-to-the-minute design *before reordering.*

MICHIGAN BROACH CO.

LET MICHIGAN FURNISH YOUR PRODUCTION PARTS *Completely Machined!*

With the largest production machine shop of its kind, Michigan will machine your production parts, complete, *assuming "undivided responsibility", for the engineering, tooling and production.*

Parts like these are machined by Michigan.

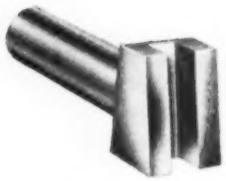
Get Michigan's quote and check costs. Michigan may be able to save you money and headaches.

Do you have our 9 folders on broaching?

MICHIGAN BROACH CO.

10373 NORTHLAWN AVENUE - - - - - - - - - - - DETROIT 4, MICHIGAN

miracles
and "Soluble" Cutting Compounds

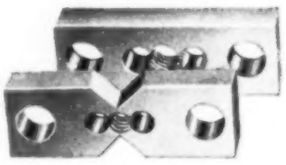


Solvol and KleenKut, Stuart's water-mixed cutting fluids, while they share in many a machining "miracle," are not "miracle" compounds. They *are* expertly engineered and manufactured products, whose performance is unsurpassed among water-mix, or "soluble" cutting fluids.

Stuart's Solvol, a "super soluble" because of its unusually high cutting quality, will handle jobs beyond the scope of conventional water-mix products, including many so-called all-purpose compounds.

Stuart's KleenKut, a more conventional product, is still an outstanding "soluble" cutting compound with a long record of superior performance.

Try Solvol or KleenKut water-mixed cutting fluids the next time you want a machining "miracle."



Have you received your copy of "Water-Mixed Cutting Fluids"?

D.A. Stuart Oil Co. LIMITED
EST. 1865
2729 SOUTH TROY STREET, CHICAGO 23, ILL.

Stuart Oil Engineering Goes With Every Barrel

You Can Grind It faster, smoother, cleaner with Economy Lubricant 1888

. . . and it's so easy to mix with water!

The ability of Economy Lubricant 1888 to provide unusually clean and free cutting wheels, fine finish, rapid chip settling, is helping many firms improve and speed production.

> A well-known concern reports:—grinding with the side of the wheel—usually a troublesome operation—wheels last two to three times as long between dressings when using 1888.

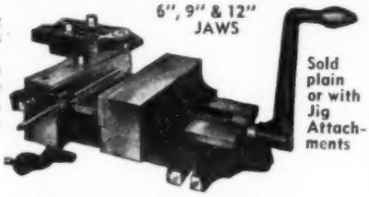
We can show you how 1888 can work for your benefit to insure long life and excellent surface. *Send for circular which describes the many unusual features of the new Economy Lubricant* 1888.

THE WHITE & BAGLEY COMPANY
WORCESTER 8, MASS., U.S.A.
Original Producers of Grinding Lubricant

GRAHAM MULTI-PURPOSE VISE

Perfect for plain holding; amazing in its many uses as a jig or fixture for accurate repeat-operation positioning. Sizes up to 124 lbs. for drill press, radial, miller, shaper, planer, grinder.

6", 9" & 12" JAWS



Sold plain or with Jig Attachments

REQUEST NEW BULLETIN 41

completely illustrating and pricing the above Vise and Attachments, also our famous *"Adjust-angle" Knurl Holder Fitting Lathe Turret*

GRAHAM MFG. CO.
83 BRIDGE ST., EAST GREENWICH, R. I.

HUOT DRILL INDEX

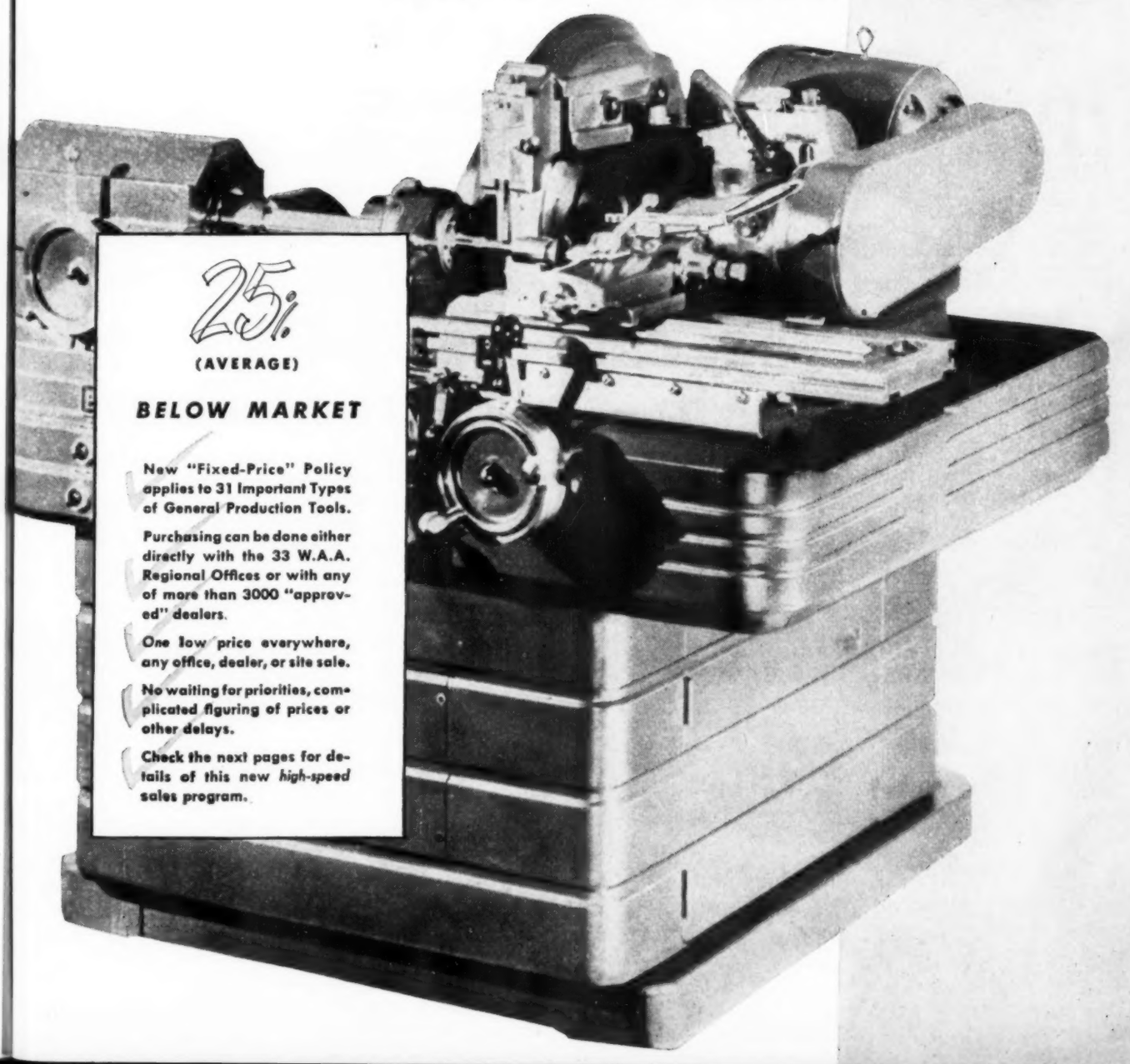
Made in nine sizes
No. 80 Wire Gauge to 1 inch

ASK YOUR DEALER . . . OR WRITE TO

HUOT
MANUFACTURING CO.
127 E. Ninth St.
St. Paul 1, Minn.

NOW YOU CAN REALLY *Buy*

SURPLUS MACHINE TOOLS



25%
(AVERAGE)

BELOW MARKET

- New "Fixed-Price" Policy applies to 31 Important Types of General Production Tools.
- Purchasing can be done either directly with the 33 W.A.A. Regional Offices or with any of more than 3000 "approved" dealers.
- One low price everywhere, any office, dealer, or site sale.
- No waiting for priorities, complicated figuring of prices or other delays.
- Check the next pages for details of this new *high-speed* sales program.

BORING MACHINE — HORIZONTAL, PRECISION, BRIDGE TYPE, SINGLE END

Manufacturer: **EX-CELL-O CORPORATION, DETROIT, MICH.**

MODEL	SIZE AND CAPACITY	SALES PRICE
2112-A Single End	6" diameter bore, x 12" table travel	$ 720.00
2112-A Single End	6" diameter bore, x 15" table travel	655.00
112-C Single End	8" diameter bore, x 16" table travel	1036.00
112-C Single End	8" diameter bore, x 20" table travel	1139.00

Manufacturer: **THE HEALD MACHINE COMPANY, WORCESTER, MASS.**

45 Bore-Matic, Standard, Single End	12" diameter bore, x 16" table travel	$ 1993.00
46-B Bore-Matic, Standard, Single End	9" diameter bore, x 14" table travel	1451.00
47-A Bore-Matic, Standard, Single End	9" diameter bore, x 13-5/8" table travel	1178.00
47-A Bore-Matic, Special, Single End	9" diameter bore, x 15" table travel	1186.00
48 Bore-Matic, Single End	6" diameter bore, x 9" table travel	714.00
48-A Bore-Matic, Single End	6" diameter bore, x 12" table travel	714.00
49 Bore-Matic, Standard, Single End	6" diameter bore, x 12" table travel	1116.00

Manufacturer: **STOKERUNIT CORPORATION, MILWAUKEE, WIS.**

Mod. 1 Horizontal Single End	4" diameter bore, x 9" table travel	354.00
Mod. 2-B Horizontal, Single End	8" diameter bore, x 15" table travel	444.00

DRILL PRESS — FLOOR TYPE SINGLE OR MULTIPLE SPINDLE

(EXCEPT 110 VOLT, SINGLE PHASE)

Manufacturer: **ALLEN—CHARLES C. ALLEN CO., BARRE, MASS.**

MODEL	SIZE AND CAPACITY	SALES PRICE
HMD—Super Speed (Floor	5/16" drill capacity, 16" swing, 3 spindle	$ 511.00
HMD—Super Speed (Floor)	5/16" drill capacity, 16" swing, 4 spindle	657.00
HMD—Super Speed (Floor)	5/16" drill capacity, 16" swing, 6 spindle	$ 948.00
HMD—Super Speed (Floor)	5/16" drill capacity, 24" swing, 1 spindle	229.00
HMD—Super Speed (Floor)	5/16" drill capacity, 24" swing, 2 spindle	382.00
HMD—Super Speed (Floor)	5/16" drill capacity, 24" swing, 3 spindle	535.00
2-KH (Floor)	5/8" drill capacity, 14" swing, 1 spindle	$ 177.00
2-KH (Floor)	5/8" drill capacity, 14" swing, 2 spindle	279.00
2-KH (Floor)	5/8" drill capacity, 14" swing, 3 spindle	381.00
2-KH (Floor)	5/8" drill capacity, 14" swing, 4 spindle	483.00
2-KH (Floor)	5/8" drill capacity, 14" swing, 6 spindle	687.00
2-KH (Floor)	5/8" drill capacity, 24" swing, 1 spindle	$ 185.00
2-KH (Floor)	5/8" drill capacity, 24" swing, 2 spindle	295.00
2-KH (Floor)	5/8" drill capacity, 24" swing, 3 spindle	394.00
2-KH (Floor)	5/8" drill capacity, 24" swing, 4 spindle	513.00
2-KH (Floor)	5/8" drill capacity, 24" swing, 6 spindle	732.00
2-MSV (Floor)	7/8" drill capacity, 16" swing, 1 spindle	$ 240.00
2-MS (Floor)	7/8" drill capacity, 16" swing, 2 spindle	449.00
2-MS (Floor)	7/8" drill capacity, 24" swing, 2 spindle	469.00
2-MS (Floor)	7/8" drill capacity, 24" swing, 4 spindle	910.00
2-MS (Floor)	7/8" drill capacity, 30" swing, 3 spindle	718.00
2-V Belted (Floor)	7/8" drill capacity, 16" swing, 1 spindle	$ 184.00
2-V Belted (Floor)	7/8" drill capacity, 16" swing, 2 spindle	266.00
2-V Belted (Floor)	7/8" drill capacity, 16" swing, 4 spindle	440.00
2-V Belted (Floor)	7/8" drill capacity, 24" swing, 3 spindle	382.00
2-V Belted (Floor)	7/8" drill capacity, 30" swing, 1 spindle	196.00
2-1/2 MSV (Floor)	1-1/8" drill capacity, 16" swing, 2 spindle	$
2-1/2 MSV (Floor)	1-1/8" drill capacity, 16" swing, 4 spindle	
2-1/2 MSV (Floor)	1-1/8" drill capacity, 16" swing, 6 spindle	
2-1/2 MSV (Floor)	1-1/8" drill capacity, 24" swing, 1 spindle	
2-1/2 MSV (Floor)	1-1/8" drill capacity, 24" swing, 2 spindle	
2-1/2 MSV (Floor)	1-1/8" drill capacity, 24" swing, 4 spindle	
2-1/2 MSV (Floor)	1-1/8" drill capacity, 24" swing, 5 spindle	
3-V Belted (Floor)	1-1/4" drill capacity, 24" swing, 1 spindle	
3-V Belted (Floor)	1-1/4" drill capacity, 24" swing, 2 spindle	
3-V Belted (Floor)	1-1/4" drill capacity, 24" swing, 3 spindle	

Manufacturer: **AVEY DRILLING MACHINE CO., CINCINNATI, OHIO**

1-MA-6 Floor, Box Column	1/2" drill capacity, 15" swing, 1 spindle	$
2-MA-6 Floor, Box Column	7/8" drill capacity, 15" swing, 1 spindle	
2-MA-6 Floor, Box Column	7/8" drill capacity, 15" swing, 2 spindle	$
2-MA-6 Floor, Box Column	7/8" drill capacity, 15" swing, 3 spindle	
2-MA-6 Floor, Box Column	7/8" drill capacity, 15" swing, 4 spindle	
2-MA-6 Floor, Box Column	7/8" drill capacity, 24" swing, 4 spindle	
2-MA-6 Floor, Box Column	7/8" drill capacity, 24" swing, 5 spindle	
2-MA-6 Floor, Box Column	7/8" drill capacity, 24" swing, 6 spindle	$
2-MA-6 Floor, Box Column	7/8" drill capacity, 30" swing, 3 spindle	
No. 3 Belted, Floor, Box Column	1" drill capacity, 24" swing, 1 spindle	
3-MA-6 Floor, Box Column	1-1/8" drill capacity, 24" swing, 6 spindle	
3-MA-6 Floor, Box Column	1-1/4" drill capacity, 24" swing, 1 spindle	
3-MA-6 Floor, Box Column	1-1/4" drill capacity, 24" swing, 3 spindle	$
3-MA-6 Floor, Box Column	1-1/4" drill capacity, 24" swing, 6 spindle	
3-BMA-1 Floor, Box Column	1-1/4" drill capacity, 24" swing, 1 spindle	
3-BMA-1 Floor, Box Column	1-1/4" drill capacity, 24" swing, 3 spindle	
No. 3 Standard Floor, Box Column	1-1/4" drill capacity, 24" swing, 3 spindle	
No. 3 Standard Floor, Box Column	1-1/4" drill capacity, 24" swing, 4 spindle	

Manufacturer: **BUFFALO FORGE COMPANY, BUFFALO, N. Y.**

Model 14 Pedestal, Box Column, "High-Speed"	1/2" drill capacity, 14" swing, 1 spindle	$
Model 2, Floor, Box Column, "Motor Spindle"	7/8" drill capacity, 16" swing, 1 spindle	
Model 2 Floor, Box Column, "Motor Spindle"	7/8" drill capacity, 26" swing, 1 spindle	

just look at these typical

Manufacturer: **CANEDY-OTTO MFG. CO., CHICAGO HEIGHTS, ILL.**

No. 5000-FV Floor, Box Column	3/8" drill capacity, 16" swing, 1 spindle	$

Manufacturer: **EDLUND MACHINERY CO., INC., CORTLAND, N. Y.**

1-B-7" Floor Type	3/8" drill capacity, 14" swing, 1 spindle	$
1-B-7" Floor Type	3/8" drill capacity, 14" swing, 2 spindle	
1-B-7" Floor Type	3/8" drill capacity, 14" swing, 3 spindle	
1-B-7" Floor Type	3/8" drill capacity, 14" swing, 4 spindle	
1-B-7" Floor Type	3/8" drill capacity, 14" swing, 6 spindle	
1-B-12" Floor Type	3/8" drill capacity, 24" swing, 1 spindle	$
1-B-12" Floor Type	3/8" drill capacity, 24" swing, 3 spindle	
1-B-12" Floor Type	3/8" drill capacity, 24" swing, 4 spindle	
2-B- 8" Floor Type	3/4" drill capacity, 16" swing, 1 spindle	
2-B- 8" Floor Type	3/4" drill capacity, 16" swing, 2 spindle	
2-B- 8" Floor Type	3/4" drill capacity, 16" swing, 3 spindle	$
2-B- 8" Floor Type	3/4" drill capacity, 16" swing, 4 spindle	
2-B- 8" Floor Type	3/4" drill capacity, 16" swing, 6 spindle	
3-B-12" Floor Type	3/4" drill capacity, 24" swing, 1 spindle	
3-B-12" Floor Type	3/4" drill capacity, 24" swing, 2 spindle	
3-B-12" Floor Type	3/4" drill capacity, 24" swing, 3 spindle	$
3-B-12" Floor Type	3/4" drill capacity, 24" swing, 4 spindle	
3-B-12" Floor Type	3/4" drill capacity, 24" swing, 6 spindle	
2-MS-12" Floor Type	3/4" drill capacity, 30" swing, 2 spindle	
4-B-12" Floor Type	1" drill capacity, 24" swing, 1 spindle	

CHECK THIS COMPLETE LIST

If tools of the type *you* need are included send today for WAA's catalog giving all sizes and models together with the fixed prices for purchases made anywhere in the U. S. Simply write, wire or phone the nearest WAA office listed on the 4th page of this advertisement.

- Boring Machine—Horizontal, Precision, Bridge Type, Single and Double End
- Chucking Machine—Automatic, Vertical, Multiple Spindle Type
- Chucking Machine—Single Spindle Automatic, Horizontal Turret Type Machine
- Chucking Machine—Six Spindle Automatic, Horizontal
- Drilling Machine or Drill Press—Bench or Floor, Single or Multiple Spindle
- Gear Cutting Machine for Straight Bevel Gears, (Not Planer Type)
- Gear Hobber—Horizontal
- Gear Hobber—Vertical, Universal
- Gear Shaper—For External Spur Gears Only
- Gear Shaper—For Spur Gears, External or Internal
- Gear Shaper—For Spur and Helical Gears, External and Internal
- Gear Tooth Shaver—For External and Internal Gears (Rotary Type Machine)
- Gear Tooth Grinder—Generating Type, for Spur and Helical Gears
- Gear Tooth Grinder—For Spur Gears, External and Internal (Formed Wheel Type Machine)
- Grinders—Centerless
- Grinder—Crank Pin Grinders
- Grinders—Plain External Cylindrical Grinder
- Grinder—Internal, Cylindrical, Automatic Sizing
- Grinder—Internal Cylindrical (Hydraulic Feed Machine)
- Grinder—Internal Cylindrical, Hydraulic Feed, for Hole and Face Grinding.
- Grinder—Surface, Rotary Table Type
- Lathe—Multiple Tool, Not Automatic, Manufacturing Type Production Lathe
- Milling Machine—Automatic and Manufacturing Knee Type
- Milling Machine—Plain Bed Type, Horizontal Spindle Machines
- Milling Machine—Vertical, Knee Type (Not Including Bench Type)
- Polishing and Buffing Machine—Bench and Floor
- Profiling Machine—Vertical, Fixed Bed Type, Single and Multiple Spindle
- Tapping Machine—Vertical, Single or Multiple Spindle
- Thread Grinding Machines
- Thread Milling Machine
- Turret Lathe—Ram Type, Plain and Universal

ALL TOOLS SUBJECT TO PRIOR SALE

Manufacturer: FOOTE-BURT COMPANY, CLEVELAND, OHIO

Floor, Box Column	3/16" drill capacity, 14" swing, 1 spindle	$ 127.00
Floor, Box Column	7/8" drill capacity, 16" swing, 1 spindle	147.00
Floor, Box Column	7/8" drill capacity, 16" swing, 2 spindle	255.00
Floor, Box Column	7/8" drill capacity, 16" swing, 6 spindle	$ 706.00
Floor, Box Column	7/8" drill capacity, 24" swing, 1 spindle	156.00
Floor, Box Column	7/8" drill capacity, 24" swing, 2 spindle	274.00
Floor, Box Column	7/8" drill capacity, 24" swing, 3 spindle	$ 391.00
Floor, Box Column	7/8" drill capacity, 24" swing, 4 spindle	510.00
Floor, Box Column	7/8" drill capacity, 24" swing, 6 spindle	745.00
Floor, Box Column	1-1/4" drill capacity, 24" swing, 1 spindle	$ 279.00

Manufacturer: THE FOSDICK MACHINE TOOL CO., CINCINNATI, OHIO

Box Column	7/8" drill capacity, 24" swing, 1 spindle	$ 255.00
Box Column	7/8" drill capacity, 24" swing, 3 spindle	601.00
Box Column	7/8" drill capacity, 24" swing, 4 spindle	793.00
Floor, Box Column	1" drill capacity, 16" swing, 1 spindle	$ 293.00
Floor, Box Column	1" drill capacity, 16" swing, 2 spindle	293.00
Floor, Box Column	1" drill capacity, 24" swing, 1 spindle	307.00
Floor, Box Column	1" drill capacity, 24" swing, 4 spindle	1009.00
Floor, Box Column	1-1/2" drill capacity, 24" swing, 1 spindle	$ 722.00
Floor, Box Column	1-1/2" drill capacity, 24" swing, 2 spindle	790.00
Floor, Box Column	1-1/2" drill capacity, 24" swing, 6 spindle	2219.00

MMEDIATE DELIVERY bargains

25%

(average)
BELOW MARKET

Manufacturer: LELAND GIFFORD COMPANY, WORCESTER, MASS.

Floor, Motor Spindle	3/8" drill capacity, 12" swing, 1 spindle	$ 156.00
Floor, Motor Spindle	3/8" drill capacity, 12" swing, 2 spindle	274.00
Floor, Motor Spindle	3/8" drill capacity, 12" swing, 3 spindle	414.00
Bench, Motor Spindle	3/8" drill capacity, 20" swing, 1 spindle	147.00
Bench, Motor Spindle	3/8" drill capacity, 20" swing, 4 spindle	527.00
Floor, Motor Spindle	3/8" drill capacity, 20" swing, 1 spindle	168.00
Floor, Motor Spindle	3/8" drill capacity, 20" swing, 2 spindle	$ 308.00
Floor, Motor Spindle	3/8" drill capacity, 20" swing, 3 spindle	449.00
Floor, Motor Spindle	7/8" drill capacity, 14" swing, 1 spindle	275.00
Floor, Motor Spindle	7/8" drill capacity, 14" swing, 2 spindle	475.00
Floor, Motor Spindle	7/8" drill capacity, 14" swing, 3 spindle	691.00
Floor, Motor Spindle	7/8" drill capacity, 14" swing, 4 spindle	$ 907.00
Floor, Motor Spindle	7/8" drill capacity, 14" swing, 5 spindle	1109.00
Floor, Motor Spindle	7/8" drill capacity, 14" swing, 6 spindle	1312.00
Floor, Motor Spindle	7/8" drill capacity, 20" swing, 1 spindle	285.00
Floor, Motor Spindle	7/8" drill capacity, 20" swing, 2 spindle	491.00
Floor, Motor Spindle	7/8" drill capacity, 20" swing, 3 spindle	$ 714.00
Floor, Motor Spindle	7/8" drill capacity, 20" swing, 4 spindle	935.00
Floor, Motor Spindle	7/8" drill capacity, 20" swing, 6 spindle	1349.00
Floor, Motor Spindle	7/8" drill capacity, 26" swing, 1 spindle	297.00
Floor, Motor Spindle	7/8" drill capacity, 26" swing, 2 spindle	514.00
Floor, Motor Spindle	7/8" drill capacity, 26" swing, 3 spindle	$ 731.00
Floor, Motor Spindle	7/8" drill capacity, 26" swing, 4 spindle	984.00
Floor, Motor Spindle	7/8" drill capacity, 26" swing, 5 spindle	1206.00
Floor, Motor Spindle	7/8" drill capacity, 26" swing, 6 spindle	1426.00
Floor, Motor Spindle	1" drill capacity, 24" swing, 1 spindle	$ 427.00
Floor, Motor Spindle	1" drill capacity, 24" swing, 2 spindle	780.00
Floor, Motor Spindle	1" drill capacity, 24" swing, 3 spindle	1134.00

Manufacturer: THE TAYLOR AND FENN COMPANY, HARTFORD, CONN.

Box Column	3/8" drill capacity, 16" swing, 6 spindle	$ 477.00

Manufacturer: THE TOLEDO GENERAL MFG. CO., TOLEDO, OHIO

Floor, Box Column	7/8" drill capacity, 24" swing, 4 spindle	$ 155.00

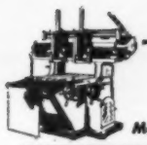
GRINDER — INTERNAL CYLINDRICAL, (HYDRAULIC FEED MACHINE)

Manufacturer: BRYANT CHUCKING GRINDER CO., SPRINGFIELD, VT.

MODEL AND DESCRIPTION	SIZE AND CAPACITY	SALES PRICE
16-16 Internal Grinder, Hydraulic Feed	16" swing x 13" stroke	$1475.00
16-22 Internal Grinder, Hydraulic Feed	22" swing x 13" stroke	1668.00
16C-16 Internal Grinder, Hydraulic Feed	16" swing x 13" stroke	1647.00
18F-28 Internal Grinder, Hydraulic Feed	28" swing x 13" stroke	$1766.00
24-26 Internal Grinder, Hydraulic Feed	26" swing x 16" stroke	2051.00
24-36 Internal Grinder, Hydraulic Feed	36" swing x 16" stroke	2427.00
24L-26 Internal Grinder, Hydraulic Feed	26" swing x 24" stroke	$2589.00
112M Internal Grinder, Hydraulic Feed	16" swing x 9" srroke	2292.00
16-30 Internal Grinder, Gap Bed	38" swing x 9" stroke	1800.00

Manufacturer: THE HEALD MACHINE COMPANY, WORCESTER, MASS.

81 Plain Chucker, Internal Grinder, Hydraulic Feed	9" swing x 3" stroke	$1122.00
72-A-3 Plain Chucker, Internal Grinder, Hydraulic Feed	11-1/2" swing x 12" stroke	1327.00
72-A-5 Plain Chucker, Internal Grinder, Hydraulic Feed	11-1/2" swing x 20-5/8" str.	1415.00
74 Plain Chucker, Internal Grinder, Hydraulic Feed	24" swing x 15" stroke	$1940.00
172, Gap, Plain, Internal Grinder, Hydraulic Feed	36" swing x 13" stroke	1778.00



PROFILING MACHINE — VERTICAL, FIXED BED TYPE, SINGLE AND MULTIPLE SPINDLE

Manufacturer: THE FREW MACHINE COMPANY, PHILADELPHIA, PA.

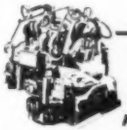
MODEL AND DESCRIPTION	SIZE	SALES PRICE
No. 6-A Single Spindle	24" x 36" table size	$ 793.00

Manufacturer: MOREY MACHINERY COMPANY, INC., NEW YORK, N. Y.

No. 12-M Single Spindle	23" table travel	$ 705.00
No. 12-M Two Spindle	23" table travel	742.00

Manufacturer: PRATT AND WHITNEY DIVISION, HARTFORD, CONN.

No. M-1693 Single Spindle, No. 12-B	20" table travel	$ 731.00
No. M-1693 Two Spindle, No. 12-B	20" table travel	844.00
No. M-1482 Single Spindle	32" table travel	1675.00



GEAR TOOTH GRINDER — GENERATING TYPE, FOR SPUR AND HELICAL GEARS

Manufacturer: THE FELLOWS GEAR SHAPER CO., SPRINGFIELD, VT.

MODEL AND DESCRIPTION	SIZE AND CAPACITY	SALES PRICE
No. 12 Spur and Helical, External only	12" pitch diameter x 1-1/2" face width	$ 1117.00

Manufacturer: PRATT AND WHITNEY DIVISION, HARTFORD, CONN.

M-1635 Spur	10- 1/4" pitch diameter x 6" face width	$ 1791.00
M-1639 Helical	10-11/16" pitch diameter x 6" face width	2528.00
M-1679 Helical, Two Wheel	10-11/16" pitch diameter x 1-1/4" face width	3300.00
M-1838 Helical	18- 1/2" pitch diameter x 6" face width	4292.00

GOVERNMENT WAA SURPLUS

Sales to priority claimants, which include Federal Agencies, Certified Veterans, World War II, and subsequent priority claimants, will be made in proper sequence as required by law.

Exporters: Your business is solicited. If sales are conducted at various levels, you will be considered as a wholesaler. Any inquiries regarding export control should be referred to Office of International Trade, Department of Commerce, Washington, D. C.

. . . and no priorities needed

To make purchases visit any of the W.A.A. offices listed below; your regular machine tool dealer, or any W.A.A. Machine Tool Site Sale advertised in your local paper. You can arrange on the spot for immediate purchase. Remember, however, that the particular machine you want may be located elsewhere and shipping times these days are still uncertain. But you will *not* have to wait for lengthy clearances of priorities on nation-wide search of stocks. The machines *are* available for immediate sale.

W.A.A. announced last month its important New Price Policy on 31 types of General Production Tools.

But just as a reminder here is how W.A.A.'s new price has been set for a typical machine; Model 2K Kearney and Trecker Milling Machine, vertical knee type; W.A.A. S.C. Code 3417-23-20-28.

Price (New)	$7,054.00
Previous W.A.A. Sales Price (based on depreciation primarily)	4,091.00
Average Market Value	2,556.00
New W.A.A. Sales Price	2,045.00
Available for rebuilding	511.00

GOVERNMENT W A A SURPLUS

THERE IS A
WAA REGIONAL OFFICE
NEAR YOU

(starred offices have the longest and most complete inventories of surplus machine tools—but stocks are extensive in *all* offices. Watch your newspaper for special machine tool sales in your area).

Offices located at:

Atlanta	Helena	Omaha
Birmingham	Houston	*PHILADELPHIA
*BOSTON	Jacksonville	Portland, Ore.
Charlotte	Kansas City, Mo.	Richmond
*CHICAGO	Little Rock	Salt Lake City
Cincinnati	Los Angeles	*ST. LOUIS
*CLEVELAND	Louisville	San Antonio
Dallas	Minneapolis	San Francisco
Denver	Nashville	Seattle
*DETROIT	New Orleans	Spokane
Fort Worth	*NEW YORK	Tulsa

MACHINE TOOL
SALES DIVISION

686-2

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Immediate Delivery

HIGH SPEED STEEL, STRAIGHT SHANK

TWIST DRILLS

EXTRA LENGTH

9" CUTTING FLUTES—12" LONG DRILLS

SIZE INCHES	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET	SIZE INCHES	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET
1/8"	12	9	$1.50	21/64"	12	9	$2.25
9/64"	12	9	1.50	11/32"	12	9	2.25
5/32"	12	9	1.50	23/64"	12	9	2.50
11/64"	12	9	1.50	3/8"	12	9	2.50
3/16"	12	9	1.50	25/64"	12	9	2.75
13/64"	12	9	1.60	13/32"	12	9	2.75
7/32"	12	9	1.60	27/64"	12	9	3.00
15/64"	12	9	1.75	7/16"	12	9	3.00
1/4"	12	9	1.75	29/64"	12	9	3.25
17/64"	12	9	1.85	15/32"	12	9	3.25
9/32"	12	9	1.85	31/64"	12	9	3.25
19/64"	12	9	2.00	1/2"	12	9	3.25
5/16"	12	9	2.00				

HIGH SPEED STEEL, TAPER SHANK

TWIST DRILLS

EXTRA LENGTH

SIZE INCHES	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET	SIZE INCHES	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET
17/32"	15	12	$6.50	27/32"	15	12	$11.50
9/16"	15	12	7.00	7/8"	15	12	12.00
19/32"	15	12	7.50	29/32"	15	12	12.50
5/8"	15	12	8.00	15/16"	15	12	13.00
21/32"	15	12	8.00	31/32"	15	12	14.00
11/16"	15	12	8.25	1"	20	15	16.00
23/32"	15	12	8.50	1-1/16"	20	15	17.00
3/4"	15	12	8.50	1 1/8"	20	15	18.00
25/32"	15	12	9.50	1-3/16"	20	15	20.00
13/16"	15	12	11.00	1 1/4"	20	15	22.00

Victor Machinery Exchange

INC.

251 CENTRE STREET **NEW YORK 13, N. Y.**

PHONE: CAnal 6-5575

THIS CHUCK BOOSTS PRODUCTION

Barker Two-Jaw Chuck

Barker Three-Jaw Chuck

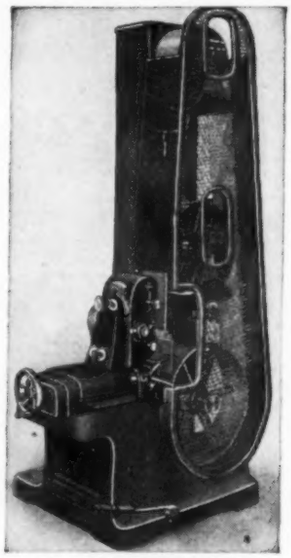
and pays for itself while doing it. With either the Two-Jaw or Three-Jaw Barker wrenchless chuck on turrets, engine lathes, cutting-off machines, drill presses or any other types of chucking machines, where the run is continuous, these chucks will increase production and actually pay for themselves in 60 to 90 days. If you want more parts per hour, at lower cost per part, a Barker Wrenchless Chuck will do it faster, better, and stand up to it longer. Ruggedly built for years of service, a Barker Wrenchless Chuck can speed up production in YOUR plant.

Write for bulletin 201 today

THOMAS HOIST CO.

Chuck Division

20 South Hoyne Avenue, Chicago 12, Illinois



NO CENTERING
NO CHUCKING
JUST FEED AUTOMATICALLY

TYPE A "PRODUCTION"

puts high-speed polishing on a truly production basis

The Type A Polishing and Finishing Machine represents "PRODUCTION'S" highest development in machines for polishing and finishing various materials such as metal, fibre, rubber and wood in tubular form up to 6" in dia. All work is handled mechanically at a high rate of production. Automatic holding and feeding devices in conjunction with abrasive belt, give a mechanical finish far superior to that attainable with hand operations.

This machine employs a patent cushion leather belt over which the abrasive belt is run—a construction which provides high points for cutting and low points for chip clearance.

Illustrated literature available on request.

Production MACHINE COMPANY GREENFIELD, MASSACHUSETTS, U.S.A.

MALLEABLE IRON

A Handbook

A presentation of technical data in sufficiently narrative form to be of interest to both the scientific and the lay reader.

It deals with the background of American Malleable Iron—its physical, mechanical and engineering properties—various types of malleable iron—pattern design — machining practice and other pertinent data including the application of malleable iron.

There are also more than 90 pages devoted to engineering tables, formulas and other useful information for the engineer.

PRICE $4.00

For the first time this fund of information on malleable iron has been compiled into one volume.

MALLEABLE FOUNDERS' SOCIETY
CLEVELAND • OHIO

MAIL COUPON TODAY!

MALLEABLE FOUNDERS' SOCIETY
CLEVELAND, OHIO

Enclosed find my check..... money order..... for $4.00 for copy of Malleable Iron Handbook.

Name .....
Company .....
Street .....
City .....Zone .....State .....

Capacities: 30 to 4000 tons.

ATTENTION!

TOOL ROOMS and DIE SHOPS

. . . Explore the possibilities of the NEW M & N HYDRAULIC HOBBING PRESS

This is a completely self-contained press for heavy duty accurate die work and has already demonstrated its ability to meet the exacting requirements of tool rooms and mold shops.

Compact in design with four columns, upward-moving platen, and with motor and pump in base . . . a completely self-contained unit. Prompt in response and absolute control of moving parts. Power connection is the only outside connection necessary.

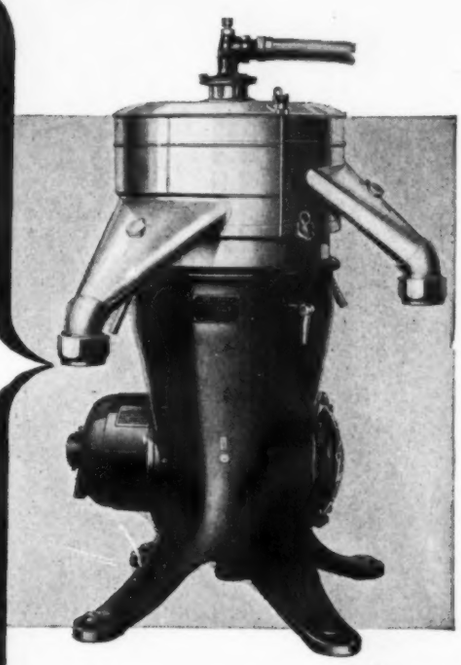
Ask for further details and submit your requirements to our engineers.

Early Deliveries

M & N MACHINE TOOL WORKS
152 ORONO ST., CLIFTON, N. J.

IN ALL THESE APPLICATIONS

- BALER OIL
- BORING OIL
- BRIQUETTING OIL
- CABLE OIL
- CUTTING OIL
- DRAWING OIL
- ENGINE OIL
- GRINDING COOLANT
- HONING OIL
- HYDRAULIC OIL
- LUBRICATING OIL
- MOTOR BLOCK TEST OIL
- QUENCHING OIL
- RECOIL OIL
- SHOCK ABSORBER OIL
- SLUSHING OIL
- TRANSMISSION OIL
- WASHING OIL



—Clean oil pays off!

OILS that are only "halfway clean" aren't clean enough for many factory applications. Water renders slushing compounds and hydraulic oils actually harmful. Dirt and metallic particles spoil cutting oils and grinding coolant.

These and other impurities can be removed continuously and rapidly by De Laval Oil Purifiers. These Purifiers, by means of certrifugal force, restore oil to its original clarity and cleanliness more completely . . . and more efficiently, too. They operate at constant efficiency. There are no replacements to make on De Laval machines—cleaning and normal care are all that are necessary to keep them operating at top capacity.

De Laval systems can be applied profitably to the needs of almost every shop, large or small. Portable "Uni-Matic" Oil Purifiers can be used for many different applications in one shop. Or, where operations are extensive enough to warrant it, a specially designed De Laval system can be permanently installed.

Discuss your oil purifying problems with our engineers. They'll show you just how—and how much—clean oil can pay off in your plant.

• Write for Bulletin FF.

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York 6 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 19
THE DE LAVAL COMPANY, Limited
MONTREAL PETERBOROUGH WINNIPEG VANCOUVER

Save more than the Oil with

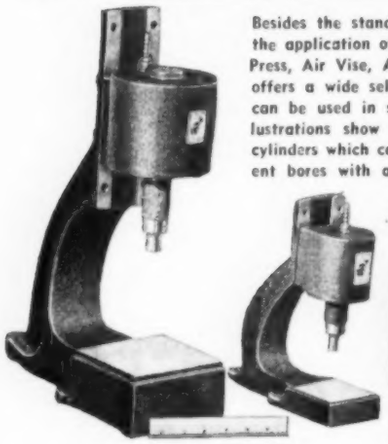
PURIFIERS and CLARIFIERS FOR FACTORY OILS

DE LAVAL

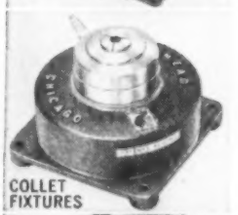
MEAD *Presents*

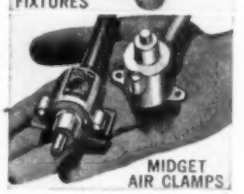
These New Money-Saving

AIR OPERATED DEVICES



Besides the standard, ready-made fixtures for the application of Air Power, (such as the Air Press, Air Vise, Air Chuck, Air Clamp) Mead offers a wide selection of air cylinders which can be used in special jigs and fixtures. Illustrations show four types of double-acting cylinders which can be furnished in five different bores with optional length of stroke.





Use MEAD AIR POWER

Get faster, more economical production set-ups—investigate the entire "family" of Mead Air-Operated devices. Do you want to move things—lift them, slide them, tilt them—or hold them firmly? Mead Air Power will do it. Do you need a delicate flexible touch — or tremendous power? Mead Air Power has both.

Catalog Ready

Send for copy of our new Air Power Catalog illustrating, describing many new money-saving devices.

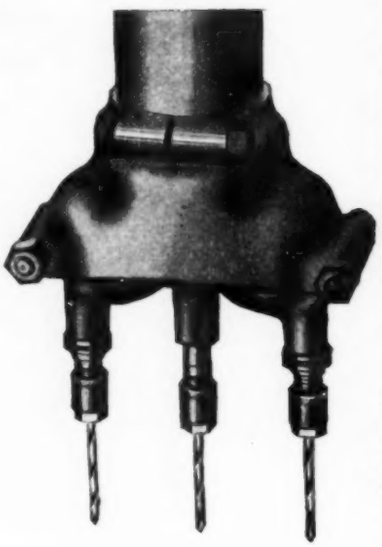
MEAD AIR OPERATED DEVICES *save precious man-hours!*

MEAD SPECIALTIES COMPANY

15 SO. MARKET STREET
DEPT. 62EA • CHICAGO, U. S. A.

SELLEW KOST KUTTERS

WILL GREATLY INCREASE YOUR DRILLING OUTPUT



Drills 2 or 3 holes in a line. Minimum adjustment .65", maximum adjustment between outside spindles 3.4". (Size 20-AD.) (1/8" drill capacity.)

Larger size (20-D) drills 2 or 3 holes in a line, minimum adjustment between spindles .9", maximum adjustment between outside spindles 4.6". 1/4" drill capacity.

(IMMEDIATE DELIVERY)

Also larger size adjustable heads, as well as special fixed spindle heads to order.

Manufacturers of Drill Heads, and Drilling Machinery for over 35 years.

SEND US YOUR DRILLING PROBLEMS

SELLEW MACHINE TOOL COMPANY

INC. 1910 **PAWTUCKET, R. I.**

PORTELVATOR is the handiest necessity in any plant. Moves heavy material without strain. Raises. Lowers. Then moves again to the next operation.

Used to support overhanging work. To lift heavy castings. To load and unload. To transport supplies. Used in a thousand ways to expedite the work and lessen the strain of lifting and holding. Even used as a portable work bench.

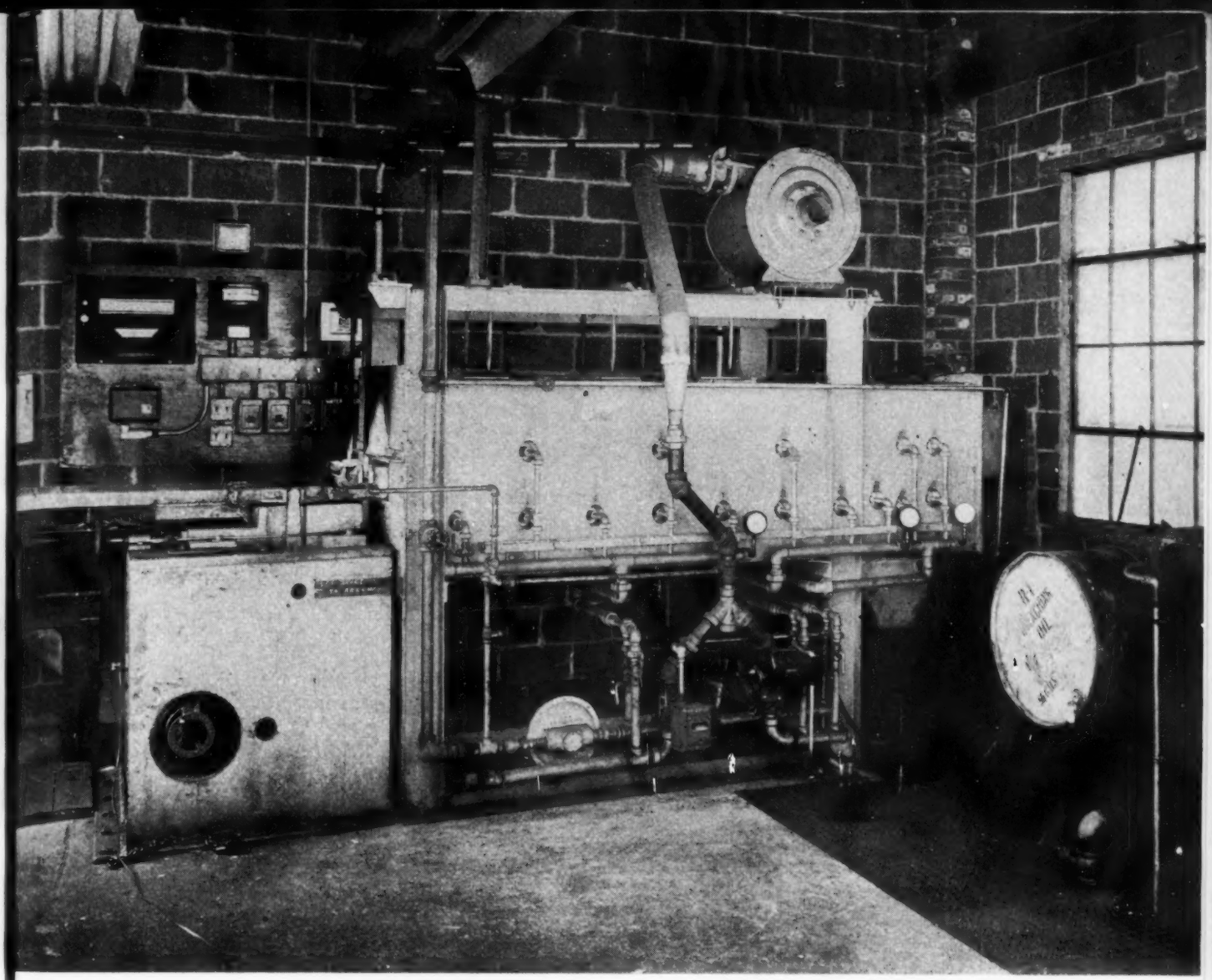
Many models in stock. Special models designed and built to fill your particular need.

Write for literature and prices. **Now!** And be prepared to solve a problem when production pushes for attention. Address Department D.

THE *Hamilton* TOOL COMPANY

SUPER SENSITIVE DRILLING MACHINES · TAPPING MACHINES · PORTELVATORS

NINTH STREET AT HANOVER · HAMILTON · OHIO · U·S·A



Reciprocating Heating Machine in the Plant of Well-Known Hardware Manufacturer

VERSATILE RECIPROCATING HEATING MACHINES SUITED TO WIDE VARIETY OF PROCESSES AND PRODUCTS

VERSATILITY is an outstanding characteristic of A.G.F. Reciprocating Heating Machines, which are suited to continuous clean hardening, annealing, normalizing, case-hardening by the patented Ni-Carb process, and many other types of work.

AMONG USERS are manufacturers of bearings, screws, lock washers, tools, wrenches, flat and coil springs, steel writing pens, and many others. Commercial heat treaters especially favor Reciprocating Heating Machines because these machines are able to handle the many varied and different jobs daily received in a general heat-treating shop.

THE RECIPROCATING MUFFLE advances work through the heat by its own momentum. The complete elimination of conveying mechanism from the heating chamber reduces maintenance problems and heat losses to a minimum. There is no traveling belt to be alternately heated and cooled—only work enters and leaves the machine.

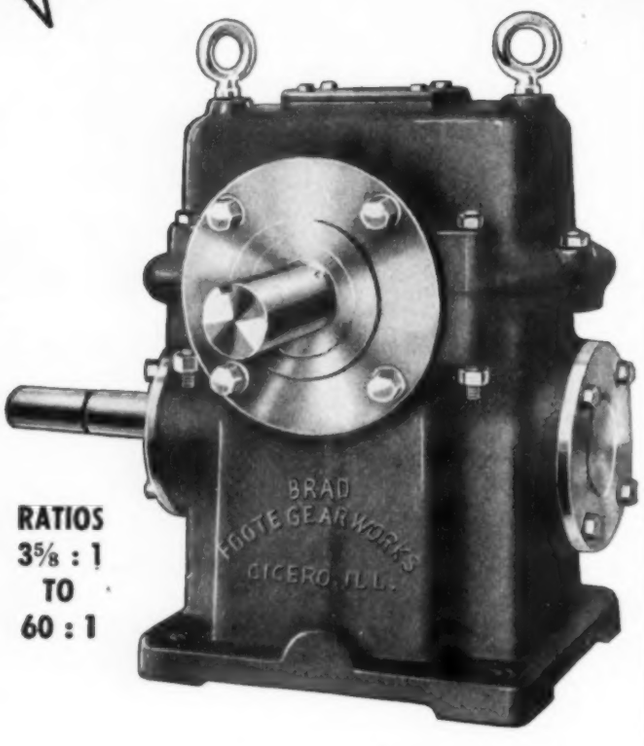
MANUFACTURED IN FIVE SIZES, Reciprocating Heating Machines have capacities ranging from 10 to 1200 pounds of work per hour. Write for detailed literature on these machines and other types of heat-treating equipment.

Engineering representatives are available in principal cities. Consult your local directory.

AMERICAN GAS FURNACE CO.

Elizabeth, New Jersey

WORM GEAR SPEED REDUCERS



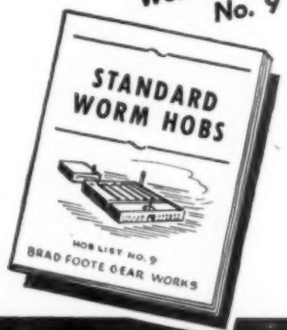
RATIOS
3⅝ : 1
TO
60 : 1

CAPACITY
Production with
Brad Foote Gears

700 STANDARD WORM HOBS!
In Stock Ready for Use

Get our 12 page Bulletin No. 9 showing all dimensions in detail. These hobs are not for sale, being solely for customer use.

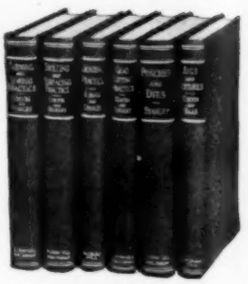
Send for Worm Hob List No. 9



BRAD FOOTE GEAR WORKS
1309 SOUTH CICERO AVENUE
DEPARTMENT P, CICERO 50, ILLINOIS

The set of books that makes

MASTER MACHINISTS
and leads to bigger pay!



This big home-study and reference course gives you the practical facts on machines and methods you need to advance in machine shop work. Take advantage of the other man's experience as found in books, to solve your problems, increase your efficiency with

AMERICAN MACHINISTS' LIBRARY
6 volumes, 2516 pages, 2368 illustrations, many charts and tables

THESE books answer your questions on methods and machines—tell what you need to know about the operation of machines of all types and sizes for the whole range of metal cutting, forming, and finishing operations—show by text, diagram, and illustration the essential points of setting up work, adjusting machines, selecting feeds and speeds, determining pressures, handling materials, devising short-cuts, etc.

Puts the mastery of machine-shop work at your fingertips

With these books at hand for quick reference, no job is too hard or unusual, and the routine jobs may be improved, with savings in time and trouble and reduced wastage.

What the Library gives you

—complete guide for everybody, from shop executive to apprentices, interested in the operation of machines used in turning and boring practice

—description of all important varieties of machine, both manual and automatic, and methods of operating them

—data on speeds and feeds, new cutting alloys and materials, use of coolants, etc.

—practical information on grinding machines and abrasive wheels, showing what they do, how to operate them, and how to make best use of them on various types of work

—training in the various operations performed in drilling and surfacing materials in the machine shop

—exact, descriptive data on all aspects of gear-cutting practice, useful in shops of any size

—essentials of selecting machines, setting up work, and handling operations in reaming, tapping, planing, shaping, slotting, milling and broaching.

No Money Down — Easy Payments

Let us send you these fact-packed books for 10 days' examination, with no obligation to buy the books unless you want them. Remember that if you decide to keep the books the special library price represents a saving of $2.50 on the price of the books if you were to buy them separately. Furthermore, you may have the privilege of paying in small monthly installments, while you use the books. Invest in life's soundest commodity—KNOWLEDGE. Send the coupon today.

McGRAW-HILL FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y.

Send me the American Machinists' Library, 6 volumes, charges prepaid, for 10 days' examination. If I find the books satisfactory, I will send you $4.00 in 10 days, and $4.00 a month until the special price of $20.00 has been paid. Otherwise I will return the books postpaid. (To insure prompt shipment write plainly and fill in all lines.)

Name .....

Address .....

City and State .....

Company .....

Position ..... F.A. 1-16-47

For Canadian prices write Embassy Book Co., 12 Richmond St., E., Toronto 1

wheelabrator

A NIAGARA of CLEANING POWER!

Perfectly controlled to give you faster, more economical cleaning production

Speed cleaning at low cost results from the flood of abrasive that pours in a constant torrent from the spinning wheel of an Airless Wheelabrator . . . impacts from more than a quarter-million particles of abrasive per second or 300 pounds of abrasive per minute.

In terms of airblasting it would take approximately five 3/8" nozzles operating under an air pressure of 90# P. S. I. and utilizing up to 225 H. P. to equal the foregoing accomplishment of a standard Wheelabrator requiring only 15 H. P.

The blast stream of the Wheelabrator is under perfect control and the full impact of its power is uniformly concentrated upon the job, scouring sand and scale from every pocket, recess, and fissure. Unlike airblasting there are no variations in pressure, velocity or abrasive volume to alter cleaning efficiency and production speeds. Wheelabrating can be timed practically to the second.

Savings result from reduced costs of labor, power, space, machining and grinding, cutting tools, inspection, etc., as reflected in the following statements of users:

WHEELABRATOR SAVINGS TOLD BY USERS*

"Reduced cleaning time approximately 50%."	(Malleable Foundry)
"Reduced direct labor costs 50%."	(Automotive Mfr.)
"Saved 300 cubic feet of air per minute."	(Malleable Foundry)
"5 hours' cleaning time reduced to 15 minutes."	(Michigan Mfr.)
"Our electric bills have been cut almost in half."	(Gray Iron Foundry)
"Cleaning now with four less operators."	(Gray Iron Foundry)
"Time cut from 24 hours to 8 hours."	(A Connecticut Steel Foundry)
"Decided increase in tool life between grinds."	(Prominent Tool Mfr.)
"Replaced 14 tumblers, saving considerable space."	(Canadian Mfr.)
"18 hours' cleaning time reduced to 3 hours."	(Brass Foundry)
"Machinability much improved over tumbled castings."	(Gray Iron Foundry)

* Names of users supplied upon request.

WHEELABRATOR TUMBLASTS

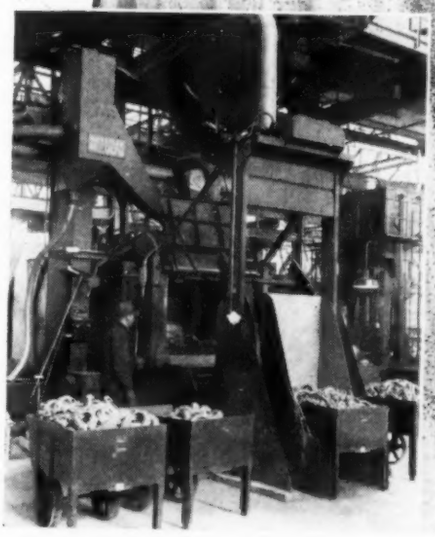
Tumblasts are made in eight sizes, having capacities of 1 to 63 cu. ft. for handling loads ranging from less than a hundred pounds to several tons, and for cleaning individual parts weighing from a fraction of an ounce up to hundreds of pounds each.

TABLES

Tables are used for cleaning flat or fragile work that is not adapted to tumbling. Built in three types: The *Multi-Table* is recommended for work having high vertical edges or intricate recesses and cavities. The *Plain Table* is especially suitable for work having few pockets and vertical edges, such as furnace castings. The *Swing Table* is an ideal general purpose machine for handling a wide range of large and small pieces.

SPECIAL CABINETS

Cabinets are specially designed and engineered for handling work where special production problems prevail or where the work, due to size, shape or weight, cannot be adapted to a standard machine.



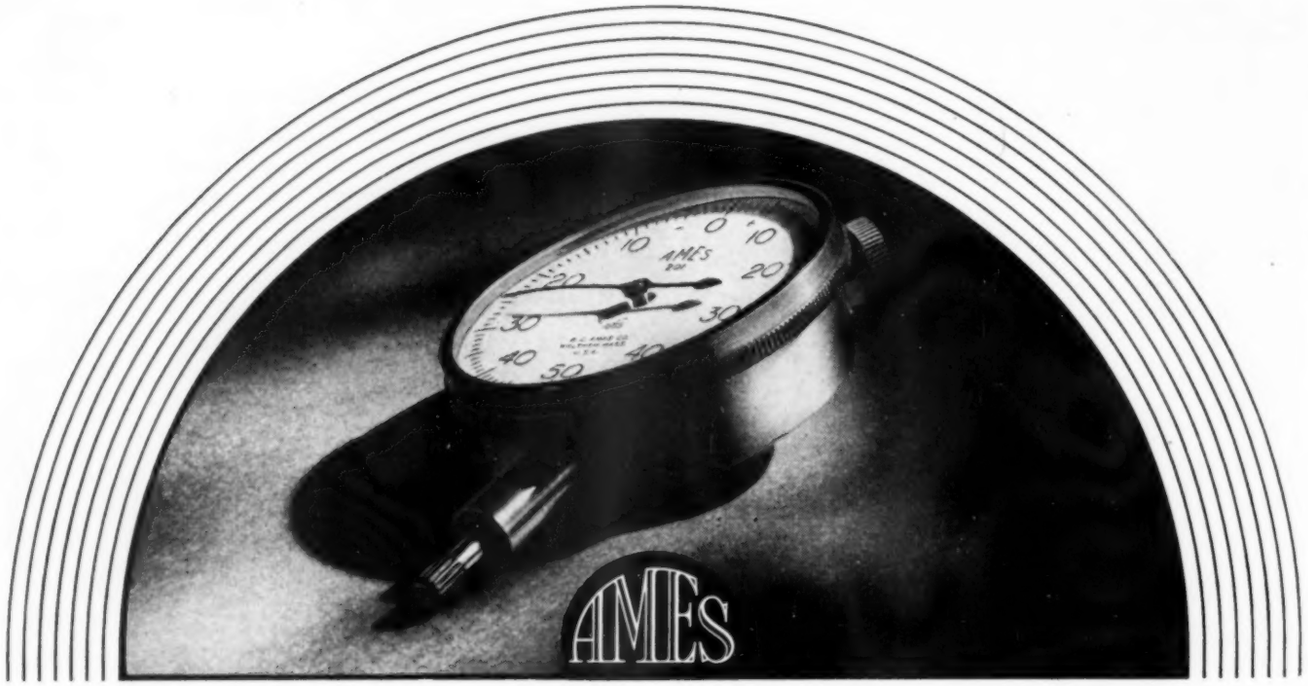
American

WHEELABRATOR & EQUIPMENT CORP.

(Formerly American Foundry Equipment Co.)

317 SOUTH BYRKIT STREET, MISHAWAKA, IND.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT



FOR MILLIONS OF READINGS!

In Dial Indicators you should insist on sensitivity, accuracy, *and long life* — the only kind of indicators that AMES has been making for 50 years.

Many features of AMES design are exclusive. Only the best, the most-lasting materials are used. Add expert craftsmanship in every particular, and you have AMES Indicators . . . that will outlast any other indicator you can buy—at any price. Send for illustrated Catalogue.

Representatives in principal cities

B. C. AMES CO.

26 Ames Street Waltham 54, Mass.

MANUFACTURER OF MICROMETER DIAL GAUGES AND MICROMETER DIAL INDICATORS

4 Sizes—60 Models

English or Metric Measure

Balance or Continuous Dials

Plain or Compound Movement

Many Graduations and Ranges

Forged Brass Case and Stem

Hardened Steel Staffs and Pinions

Forged Wheel Supports

Hardened Steel Guidepin and Guide Block

Burnished Hardened Bearings

SEARCHLIGHT SECTION

AMERICAN MACHINIST

330 West 42nd St., New York 18, N. Y.

WHERE-TO-BUY USED MACHINE TOOLS AND SHOP EQUIPMENT

The numbers appearing under a classification identify advertisers so numbered in the alphabetical index.

ACCESSORIES—30
AUTOMATICS—1, 6, 11, 17, 21, 24, 35, 40, 41, 46, 49, 50, 51, 53, 56, 68
BENDING MACHINES—2, 8, 24, 36, 37, 38, 46
BLUE PRINT MACHINES—56
BOLT MACHINES—41, 51, 53, 72
BORING MILLS—1, 6, 9, 10, 11, 12, 17, 24, 26, 27, 32, 35, 37, 41, 46, 47, 48, 50, 51, 52, 55, 67, 68, 71, 72, 74, 75
BROACHING MACHINES—2, 17, 41, 46, 47, 50, 51, 58, 68
BUFFERS & POLISHERS—2
CENTERING MACHINES—51
CHUCKING MACHINES—9, 11, 56
COMPRESSORS—41
CUTTING OFF MACHINES—6, 12, 19, 27, 39, 41, 44, 51, 58
DIE SINKING MACHINES—2
DRILLING & REAMING MACHINES—1, 2, 3, 4, 5, 6, 9, 10, 17, 24, 26, 32, 35, 36, 37, 38, 41, 46, 47, 48, 51, 52, 53, 55, 56, 62, 66, 68, 69, 70, 72, 73, 74, 75, 76
ENGRAVING MACHINES—1, 24, 53, 66, 70
FLANGING MACHINES—8, 39
FORGING EQUIPMENT—1, 2, 6, 41, 51, 53, 62
FOUNDRY EQUIPMENT—24
FURNACES & OVENS—21, 37, 39
GAGING & TESTING EQUIPMENT—14, 24
GEAR CUTTING MACHINES—2, 5, 6, 10, 12, 17, 24, 27, 32, 35, 41, 42, 44, 46, 49, 50, 51, 56, 67, 68, 70
GRINDING MACHINES—1, 2, 3, 5, 6, 9, 10, 12, 15, 17, 24, 31, 32, 35, 36, 38, 41, 42, 46, 47, 48, 49, 50, 51, 52, 53, 56, 58, 62, 66, 68, 69, 74, 75
HONING & LAPPING MACHINES—31, 35, 41
KEYSEATERS—76
LATHES—1, 2, 3, 5, 6, 9, 10, 11, 12, 15, 17, 19, 20, 21, 24, 26, 27, 31, 32, 35, 38, 40, 41, 42, 46, 47, 48, 49, 50, 51, 52, 53, 55, 56, 58, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76
MATERIALS—28
MATERIALS HANDLING EQUIPMENT—(cranes—hoists—lifts—etc.) 18, 41
METAL CLEANING EQUIPMENT—27
METAL WORKING EQUIPMENT—GENERAL—7, 13, 16, 23, 25, 43, 54, 57, 60, 61, 63, 64
MILLING MACHINES—1, 2, 3, 5, 6, 10, 11, 12, 15, 17, 19, 24, 26, 27, 31, 32, 35, 37, 38, 40, 41, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 55, 56, 58, 62, 66, 68, 69, 70, 71, 72, 73, 74, 75, 76
PIPE CUTTING & THREADING MACHINES—1, 37, 51, 56
PLANERS—6, 10, 12, 17, 24, 29, 32, 35, 36, 39, 41, 42, 46, 47, 51, 67, 68, 72, 76
PLATING EQUIPMENT—26
POWER EQUIPMENT—13, 35, 51
PRESSES—1, 2, 6, 8, 12, 19, 24, 26, 29, 33, 35, 36, 38, 41, 44, 46, 50, 53, 58, 59, 64, 74, 75
PUMPS—34, 41
RIVETING EQUIPMENT—24, 41, 53
SHEARS—1, 2, 3, 36, 37, 38, 41, 66
SHAPERS—1, 3, 5, 10, 12, 24, 27, 35, 37, 40, 41, 46, 47, 48, 50, 51, 53, 55, 56, 70, 73
SHEET METAL MACHINERY—8, 24, 35, 46, 53, 70
THREADING MACHINES—20, 21, 24, 35, 46, 51, 53, 72
WELDING EQUIPMENT—1, 2, 8, 22, 24, 26, 38, 53, 56, 59
WIRE MACHINES—24, 51, 53
WOODWORKING MACHINES—51

OTHER "OPPORTUNITIES" IN THE METAL WORKING INDUSTRY

Classification	*Page*
BUSINESS OPPORTUNITIES	423
CONTRACT WORK	422
EMPLOYMENT SERVICE	422
PATENT ATTORNEY	423
POSITIONS VACANT	422
POSITIONS WANTED	422, 423
PROFESSIONAL SERVICES	423

Classification	*Page*
REBUILDING SERVICE	399, 405, 413, 415
Botwinik Bros., Inc.	413
Botwinik Bros. of Mass.	405
Farnham Mfg. Co.	415
Hill-Clarke Machinery Co.	415
Simmons Machine Tool Corp	399
SELLING OPPORTUNITY WANTED	423
SPECIAL SERVICES	421, 423
WANTED TO PURCHASE	423

Alphabetical Index to Advertisers

The number preceding an advertiser's name is used in the Directory to identify this advertiser under each classification in which he is offering equipment.

Advertiser's No. — Page No.

1—Aaron Machinery Co., Inc. 414, 417, 418
2—Acme Equipment Co., Inc. 419
3—Beal, Joseph & Co. 419
4—Bennett Machinery Co. 414
5—Bernstein & Co., George M. 416
6—Botwinik Bros. Inc. 413
7—Botwinik Bros. of Mass. 405
8—Brooks, Inc., B. D. 416
9—Browne'l, Hazard 417
10—Cincinnati Machinery Co., Inc. 412
11—Continental Salvage & Machinery Co. 420
12—Cox Machinery Co. 420
13—Delta Equipment Co. 415
14—DeWitt Tool Co. 421
15—Dony Machinery Co., D. E. 417
16—Eagle Precision Mfg. Corp. 420
17—Eastern Machinery Co. 396, 397
18—Economy Co, Inc. 418
19—E'yria Belting & Machinery Co., The 421
20—Emerman Machinery Corp. 401, 411
21—Enterprise Aluminum Co. 421
22—FS-844 420
23—Factory & Mill Supply Co., Inc. 420
24—Falk Machinery Co. 392, 393
25—Farnham Mfg. Co. 415
26—Galbreath Machinery Co. 419
27—General Machinery & Equipment Co. 411
28—Glazer Steel Corp. 414
29—Gotham Machinery Corp. 419
30—Greff Machine Tool Co. 421
31—Hasco Machinery Co. 402
32—Hi'l-Clarke Machinery Co. 415
33—Hyman & Sons, Joseph 408
34—Ideal Development Corp. 420
35—Indianapolis Machinery & Supply Co. 409
36—Interstate Machinery Co., Inc. 407
37—Johnson Machinery Co. 415
38—Kings County Machinery Exchange 398
39—Koontz, H. J. 420
40—Lake Machinery Co., Inc 421
41—Lang Machinery Co. 410
42—Laurens Bros., Inc. 404
43—Lebanon Steel Foundry 420
44—Lucas & Co., Inc., Austin D. 416
45—Lucas & Son, Inc., J. L. 408
46—Ma'co Machinery Co. 414
47—McDonald Machinery Co. 421
Machinery Dealers National Association 410
48—Mandel-Camras Machinery Co. 414
49—Mickleburgh 414
50—Miles Machinery Co. 403
51—Morey Machinery Co., Inc. 394, 395
52—Morris Machinery Co, Inc. 416
53—Na'ional Machinery Exchange 406
54—O'Brien Machinery Co., The 400
55—O'Conne'l Machinery Co. 413, 415
56—Osborne & Sexton Machinery Co. 418
57—Osmun Inc., R. V. 418
58—Ott Machinery Sales Inc. 413
59—Paul's Motors Machinery Supply 415
60—Petitt Bros., Machinery Co. 421
61—Press & Shear Exchange Inc. 414
62—Reyno'ds Machinery Co. 416
63—Rice & Co., Inc., Robert W. 421
64—S & S Machinery Co. 417
65—Salter, Jay 417
66—Schneir & Co., Julius J. 421
67—Simmons Machine Tool Corp. 399
68—Sun Machinery Co. 418
69—Surplus Material & Machinery Co. 413
70—United Machinery & Tool Corp. 418
71—Victor Machinery Co. 420
72—West Penn Machinery Co. 417
73—Wiener Machinery Co., Inc. 420
74—Wigglesworth Machinery Co. 409
75—Wigglesworth Machinery Co., T. R. 412
76—Zeeve & Co., Alex 417

EVERY ITEM GUARANTEED AS REPRESENTED

FALK FOR DEPENDABILITY IN REBUILT MACHINERY

AUTOMATICS

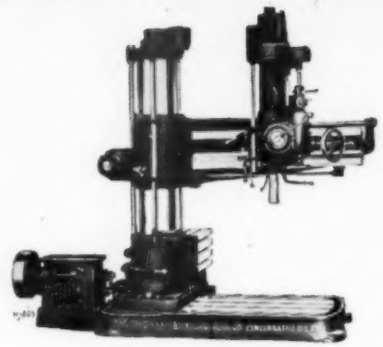
2—#00 Brown & Sharpe Full Automatic, Standard Speed

1—1¼" Cone 4-spindle Automatic, Motor Driven, Threading Spindle

1—#515 National Acme 9/16" 4-spindle Automatics, complete

LATHES

Logan Q.C.G. Lathes (new)
Sebastian Engine Lathes (new)
1—LeBlond Heavy Pattern 24"x12' 3-step cone Engine Lathe
13"x6' Williard, geared head
14"x6' Hendey Yoke Head
14"x6' Rockford Cone drive (two)
14"x20' Hendey Toolmakers Lathe
16"x6' American Motor Driven Lathe
16"x8' Lodge & Shipley 12-speed Grd. Hd.
18"x10' American, Geared Head, Taper
18"x222" Hendey, M.D. (two)
20"x10' Hendey with Taper
20"x11' Schumacher-Boye, M.D.
24"x24" American Lathe, motor dr.
28"x10' Davis cone driven
48"x30' Simmons Geared Head, 1941
1—18"x6' American geared head, motor drive
1—16"x6' Lodge & Shipley geared head, motor drive
1—24"x36' New Haven, standard change gear
1—26"x12' Putnam, cone drive, Q.C.G.
1—Bridgeford 32"x16' Geared Head
1—24"x12' LeBlond, cone drive, Q.C.G.
1—20"x8' Lodge & Shipley, cone drive, Q.C.G.
1—18"x10' Davis, cone drive, Q.C.G.
1—20"x10' American, cone drive, Q.C.G.
1—18"x6' South Bend, cone drive, standard change gears
1—16"x8' Hendey, cone drive, Q.C.G.
1—14"x6' American, Q.C.G. dial threading
1—14"x8' Rockford, Q.C.G. collets
1—14"x6' Mulliner-Edlund, Q.C.G. Toolmaker's Lathe
1—12"x5' Hendey, motor drive, Q.C.G.
1—11"x3' South Bend, cone drive, Q.C.G.
5— 9"x15" Porter-Cable Production Lathes, single pulley drive



RADIAL DRILLS

4' Arm, 11" Column Cincinnati-Bickford
5' Arm, 13" Column Cincinnati-Bickford
5' Arm, 14" Column Fosdick, motor drive
6' Arm, 15" Column Cincinnati-Bickford
3½', 10" Col., Cincinnati-Bickford AC Motor Drive, Gear Box
1—Leland-Gifford 6-spdle. Drill Press (late model) ind. spdle. motors
Cincinnati-Bickford 5' Arm, 13" round column with air clamp. Oil grooved, tee slotted base, side base, with plain box table with #5 Morse Taper spindle. Motor drive.

FOUNDRY MOULDING MACHINES

2—#0 Johnston & Jennings, Jolt Squeezer Draw Pattern, serials #58382197, #2196
3—#342 Osborn Jolt Rollover Pattern Draw Moulding Machines
2—Spo Hand Rollover Power Draw Moulding Machines complete with run-out cars

SHEARS & METAL WORKING

Lennox Splitting Shear ¾" cap.; 8' throat
Lennox Bevel Shear, ¼" cap.
Peckstow 30"x18 ga. Squaring Shear
Gould & Eberhardt Slitting Shear, 10 ga.
Niagara 48" Roller Leveller, 6 Rolls

TURRET PUNCHES

Hecker, vertical type, 8-station, air operated, 18" throat

TURRET LATHES

4—#4 Warner & Swasey Hand Screw Machines, arr. Motor Drive
2—#4 Warner & Swasey Universal Turret Lathe, Motor Driven
16" Warner & Swasey Brass Lathe
#2A Warner & Swasey Universal
#3R Gisholt Universal like new
#4 Foster GFH Hand Turret Lathe
3—Morey #2G Geared Head Turret Lathe, motor drive (late model)
2—Simmons #2 (microspeed) Turret Screw Machine (late model)
Bullard 42" Vertical Turret Lathe

MILLING MACHINES

#3, #4, #5 Cinn. High Power, Plain, S.P.D.
#1-#1½ Brown & Sharpe Plain Miller
P & W 2½" Duplex Spline Miller
Thread Miller, Hall Planetary #1—24"
#8 Lees Bradner Thread Miller
#1, #2 Kempsmith Plain Millers
#3B Hendey Universal Miller, motor drive
#4 Cinn. Vertical High Power Miller. (2)
1—Rockford #2 Plain Milling Machine
1—Becker #5C Vertical Milling Machine
1—Kearney & Trecker #3B plain milling machine
1—Whitney #6 hand milling machine
1—Cincinnati 18" Mfg. plain milling machine
2—Bristol #2 hand milling machines.
2—Hardinge Vertical milling machine (bench type)
1—Ames universal milling machine, complete equipment (bench type)
1—Bickett #1 Vertical high speed vertical milling machine
1—Van Norman #0 hand milling machine
1—Garvin #12 plain milling machine
1—Becker #7H Production Milling machine
1—Brown & Sharpe #0 plain milling machine
3—Brown & Sharpe #12 Production milling machines
2—Brown & Sharpe #1Y plain milling machines

BUY FROM STOCK
Telephone
MAIN 6347-6348

FALK
MACHINERY COMPANY
Machinery Merchants

18 WARD ST.
ROCHESTER 5
N. Y.

EVERY ITEM GUARANTEED AS REPRESENTED

FALK FOR DEPENDABILITY IN REBUILT MACHINERY

GRINDERS

Queen City Dble. End Grinders, motor driven (new)
#33 Abrasive Vertical Surface
#3 Abrasive Horizontal Surface
12" No. 22 Heald Rotary Surface Grinder
16" Persons-Arter Rotary Surface Grinder
1—Gardner Dble. Opposed Grinder #14
1—Seybold 96" Knife Grinder
Oliver of Adrian Drill Grinders
Cincinnati Centerless Grinders #2 M.D.
#12 Greenfield Internal Hydromatic Grinder, sizematic type, complete with Tank and Pump. 15" swing, 5" hole; 4" deep
#2 Brown & Sharpe Surface Grinder
#70 Heald Internal Grinder
#60 Heald Cylinder Grinder
10"x18" Norton Cylindrical
2—Cincinnati, #1½ Tool & Cutter Grinders

PRESSES & PUNCHES

1—Wattson-Stillman Hydraulic Hobbing Press, 75 tons capacity
1—Long & Allstatter #1 vertical open gap punch, cap.—1½" hole through 1"
3—Geier #2, #3 hand straightening presses
1—Bliss #0 backflywheel power punch press, 1" stroke
1—Lucas 15 ton, power arbor press
1—Bliss & Williams #3½" power punch press
1—Greenard #5 Arbor Press
1—Hudson-Sharpe Horizontal Pneumatic press
7—Adriance #34 Kick Presses
1—Adriance #32 Kick Presses
1—Zeh & Hannaman single action, cam power press, spring return type

PLANERS

20"x20"x24" N.B.P., Planer Shaper
26"x26"x8' Gray Planer, 2 heads

DRILLING MACHINES

Avey, 2 & 3 spindle Prentice, 4 spindle
Henry & Wright, 6 spindle, #2 M. T.
Fosdick 13" Super speed 4-spindle drills
Natco #12, 12 spindle #1 M. T.
2—Natco #14, 22 spindle Rectangular head Drilling Machine, #2 M. T.

SHAPERS & GEAR CUTTERS

1—Whipp 16" B. G. Crank Shaper
1—Fellows #6—36" Gear Shaper
Barber-Colman Gear Hobbers #2, #3
1—Brown & Sharpe #3—26" Automatic Gear Cutter
#1 Adams Gear Hobbers, Belt driven (2)
24" American Direct Motor Drive
Slotter 12" stroke New Haven, motor drive

2—#16 Blanchard Surface Grinder, 30" dia., magnetic chuck, 25 h.p. motor on spindle
2—#2 Cincinnati Centerless Grinder
Pratt & Whitney Vertical Surface Grinder, 14"x36" with 10"x36" Magnetic Chuck. Ball Bearing Spindle. Perfect Condition
#2 Cincinnati Universal Tool and Cutter

BORING MILLS

3½" Bar Landis-Rochester Horizontal Boring Mill, Model #36
#31 Lucas Horizontal Boring Mill, 3" bar

MISCELLANEOUS

1—Toledo 10 K.W. Spot Welder
1—Ace 20 KVA Spot Welder
1—Toledo 15 KW Spot Welder
1—Eisler 1 KVA Spot-Butt Welder
1—Zeus-Gibb 5-7 KW Arc Welder
1—Gould's motor driven car washer
Boston Wire Stitching Machines (floor & bench types)
15 KVA Ace Spot Welder, 18" throat, 1/60/440 volt
Morrison #2 Wire Stitcher, motor driven
1—Sleeper & Hartley #2 Wire Coiling Machine, motor drive
2—Garvin #1, 2-spindle automatic tapping machines
2—Garvin #1, single spindle tapping machines
1—Manville #3 Thread Rolling Machine
1—Pratt & Whitney 6"x24" Thread Milling Machine
1—Rickert-Shafer Radial Tapping Machine, motor drive
2—Howe Bench Scales, 250# capacity
2—Cochrane-Bly, Cold Saws, 13½" dia. blade
1—Walker-Turner Jig Saw, motor driven
1—Doall, saw & file machine, model #J, motor drive
1—Sterling Power Hack Saw, 8"x8"
1—Dekom 4"x4"x⅜" Angle Bending Rolls, motor drive
Rivet Spinners—Townsend, Grant, Penn, floor types
Frederick Slip Roll Former, capacity—22 ga.x36"
1—Gorton #1-A Engraving Machines
1—Merrill Pipe Threading Machine, capacity—2" to 12", motor drive
1—Firth, electric furnace, inside area—13½"x3¾"x3"
1—Standard, gas furnace, #425, inside area —24"x12"x12"
1—Leeds & Northrup electric furnace, inside area—19"x10"x6"
1—Maehler Steam Oven, 90# steam output
2—Cochrane & Bly Saw Filing Machines #2
2—Cochrane-Bly #11-S Automatic Saw Filing Machines
3—Theil-Marburg #3 Universal Sawing & Filing Machines
1—Sullivan 8x8 Horizontal Air Compressor
1—Curtis Vertical 8x8 Air Compressor
1—Fox #5 Tube Cutter, 1½" dia. capacity
1—York, Ammonia Compressor 2 ton capacity
1—Oilgear, Horizontal, Hydraulic Broach, 20,000# capacity
1—Schick, Heavy Duty, Power Baling Machine, 24"x36"x30" bale
1—Taber, Agitater Tank with pump

POWER PRESS HEADQUARTERS

Famco Arbor & Foot Presses (new)
#4 Bliss D. C. Forging Press
200 ton A.C.F. Hydraulic Press. Bed. 24"x36", 4-post.
75 ton H.P.M. 2 post, Hydraulic Press
Hilles & Jones #4 Single End Punch and Shear. Equipped as Plate Shear with 18" Blades. ARR, motor drive, 54" throat

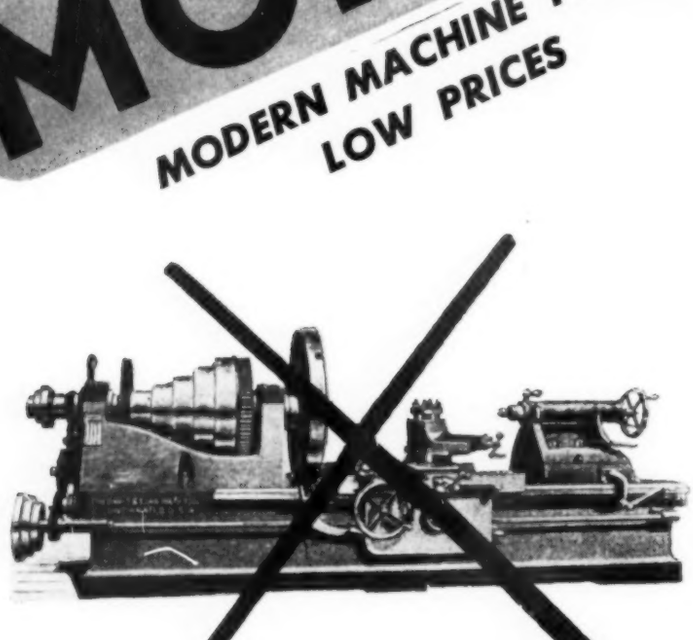
BUY FROM STOCK
Telephone
MAIN 6347-6348

FALK
MACHINERY COMPANY
Machinery Merchants

18 WARD ST.
ROCHESTER 5
N. Y.

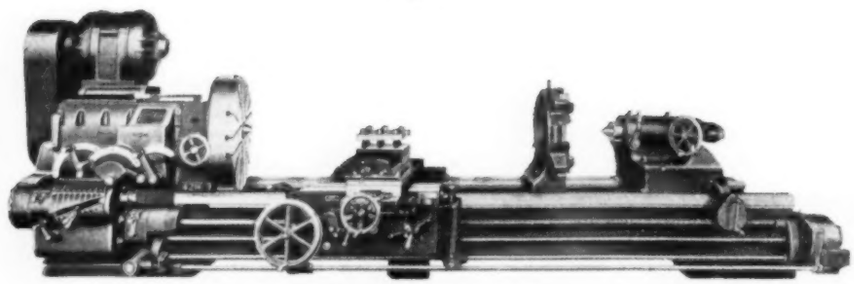
MOREY

MODERN MACHINE TOOLS
LOW PRICES



ENABLES YOU TO REPLACE
OBSOLETE EQUIPMENT

WITH *—this!*



MODERN—LATE TYPE MACHINE

NEARLY

AUTO. SCREW MACHINES

BILLINGS & SPENCER B-2 Diametic—Latest
BROWN & SHARPE #4, 1½ Cap., Latest type
CLEVELAND ⅞" to 2½" Model A
CONOMATICS 3½" 4 spindle—latest type
NATIONAL ACME 9/16" mod. C, 5 spdle., M.D.

BORING MILLS—Horizontal

DETRICK & HARVEY—5" bar—floor type—motor
FRANKLIN 4½" bar, single pulley drive
GIDDINGS & LEWIS #25—2⅜" bar, M.D.
LANDIS #35—3½" bar—floor type
NILES BEMENT POND 5½" bar—M.D.
NILES BEMENT POND 5", 6", 7" bar—floor type
OHIO #5F-420 5" bar, floor type, latest type
P & H #10, 3½" bar, floor type, M.D.
UNIVERSAL #40 Tri-way—4" bar

BORING MILLS—Vertical

BETTS 120"—2 swivel heads, motor drive
BULLARD 24", 36", 42" New Era Type, M.D.
BULLARD 86"—2 swivel heads—motor drive
COLBURN 72" 2 swivel heads, AC, M.D.
KING 30" Vert., M.D.
KING 62" 2 swivel heads, PRT, AC, M.D.
NILES 42"—2 swivel heads; power rapid traverse
NILES 73", 100", 2 swivel heads, PRT, AC, M.D.

DRILLS

BAKER #121 Single spindle—latest type
BARNES #H3, Hydram, latest type
BARNES #210—single spindle—latest
BODINE 42-20, 42-30 automatics—M.D.
COLBURN #14, 2 spindle, heavy duty, AC, M.D.
EDLUND #1B, #2B, #2MS, M.D.
FOOTE BURT SIPP #2, #3—single spindle—latest
HENRY & WRIGHT 2 spindle
PRATT & WHITNEY No. ½Bx50" 2 spindle. Deep Hole—latest type

MOREY MODERN MACHINERY

DRILLS—Radial

AMERICAN 3'9" Hole-wizard, Latest
AMERICAN 3½'9"—Maxi-Speed, Motor Drive
AMERICAN 4'9"—4'11"—5'11"—5'13" A.C., M.D.
AMERICAN 7'17" M.D.
BICKFORD 5'13", AC, M.D.
CANEDY OTTO 3'11" New
CARLTON 4'13", 5'14", 6'15", 6'17"—M.D.
CINCINNATI BICKFORD 4'11", 4'13", 6'15", 6'19", latest type
DRESES 4'13", 5'13", AC, MD
DRESES 5'15", Universal, AC, MD
FOSDICK 5'14", AC, M.D.
MUELLER 4½'9", AC, M.D.
NILES BEMENT POND 6'15" uni., AC, M.D.
RYERSON 4'11", AC, M.D.
WESTERN 3', 4'18", 5'18", 6'20", latest type

GEAR CUTTING EQUIPMENT

BARBER COLMAN Type A Hobber—latest
BARBER COLMAN type S, #3, #12 Hobber, M.D.
BROWN & SHARPE #3H gear cutter, M.D.
FELLOWS #7, #7A type, all models, latest
FELLOWS #6, #6A type, all models, latest
GLEASON 6", 11", 18" bevel gear generator. Motor Drive
GLEASON—12" bevel gear generator—latest
GLEASON #13 tester, M.D.
GLEASON 15" Quenching Press
GLEASON 24" Bevel Gear Planer
G & E #96H Gear Hobber, with differential
GOULD & EBERHARDT #18H Hobber—M.D.
PRATT & WHITNEY 10" Grinder, hyd. latest type

DEPENDABLE MACHINE TOOLS • PROMPT SERVICE

ALL BUILT SINCE 1941

GRINDERS—Cyl.—Plain & Uni.

BROWN & SHARPE #1, #2, #3, #4 Univ., motor drive—latest type
BROWN & SHARPE #5 plain, 3x12, latest type
LANDIS 6x18, 6x20, plain, M.D.
LANDIS 6x30 Plain Type "C" Hyd. latest
LANDIS 10x24 — Universal — Type "C" — Hyd. — Latest
NORTON 10x18 Plain—motor drive
NORTON 10x36" Plain Type C, Hyd., latest type
NORTON 16x72 Plain, Type C—latest type

GRINDERS—Internal, Cutter and MISCELLANEOUS

BROWN & SHARPE #10 Tool & Cutter—latest
BRYANT No. 16—16" Chucking—Internal—latest
BRYANT #5 Internal, hyd., latest type
FITCHBURG Uni., spline shaft, hyd.
GLEASON #12 cutter grinder
HEALD 72A3 Plain internal, Latest Type
HEALD 72A3 Sizematic internal, latest type
HEALD 72A5 plain internal dial type, latest type
LEBLOND #2 uni., tool and cutter, latest type
OLIVER Tool and Cutter, Latest Type
PRATT & WHITNEY Contour Cutter—latest type
SELLERS #1, #2 Tool—Motor Drive
SELLERS #4T Uni., Tool—latest type

GRINDERS—Surface

ABRASIVE #3 22x8x12, M.D.
ARTER 8" Rotary Surface
ARTER 30" Rotary Surface—Hydraulic—latest type
ARTER Automatic Piston Ring
BLANCHARD #16, 26" Chuck, Motor Drive
BLANCHARD #16A—Dial Type—motor drive
BLANCHARD #18-30" chuck—latest
BLANCHARD #27—42" Chuck—Latest
GALLMEYER & LIVINGSTON #35—8"x24"—Hyd.
MATTISON 12x16x48 Hyd., Latest Type
MATTISON 14x16x36 Hyd., Latest Type
MATTISON 14x16x60 Hyd., Latest Type
NORTON 10x36 Hyd., Latest Type

LATHES—Engine & Mfg.

AMERICAN 36x25' centers—Timken Bearing—2 carriages P.R.T. Taper Attachment—Latest Type
AMERICAN 42x17' bed, motor drive
BRIDGEFORD 36"x28', 36"x32', 36"x35' bed—2 carriages, M.D.
HARDINGE HR59, Motor Drive, Latest Type
HARDINGE 9x54" bed, QCG, Cataract
HENDEY—12x54 centers—Mfg.—latest type
HENDEY 14"x8' bed geared head
HENDEY 22"x8' bed, geared head
HOUSTON, STANWOOD & GAMBLE 42x25' bed
LeBLOND 13"x4' bed, 17"x14' bed, 20"x48" centers, Timken Mfg.—latest
LODGE & SHIPLEY 14x30" centers, Timken, latest
LOSWING 4x34, 4x60, 8x34, 8x108, 8x60—Timken Bearing—latest type
LOSWING 5x34" Model LR Auto. Timken, latest
MONARCH 12x30" centers—Timken—latest
MONARCH 22x48" Centers, Timken, Latest
NILES 48x10' centers—heavy duty—Timken Bearing P.R.T.—Latest Type
NILES 60x10' centers—heavy duty—Timken Bearing P.R.T.—Latest Type
NILES 60x15' centers—heavy duty—Timken Bearing P.R.T.—Latest Type
PITTSBURGH 50'x30' bed—M.D.
PRATT & WHITNEY—12x30" centers—Timken
PRATT & WHITNEY 16x30" centers, Timken, latest
REED PRENTICE 14x30" centers, Timken, latest
RIVETT #608—8"x18" Centers
SPRINGFIELD 16x30" centers, 16x54" centers, Timken—latest

LATHES—Turret

GISHOLT #3, #4 Univ., Timken Bearing—latest
GISHOLT #3D Simplimatics—Timken—latest
GISHOLT #4L, 9" hole—cross sliding turret—Timken Bearing—latest type
GISHOLT #1L, #2L, uni., Timken bearing, latest
JONES & LAMSON #3, #5, #7C Univ., latest type—Timken Bearing
LIBBY #1H-5 Timken Bearing—latest 5½" hole
BARDONS & OLIVER #3, #5, #7 Timken Bearing—latest type
CINCINNATI ACME #1, #5W, Timken bearing, latest type
MOREY #G, #3, #4, Timken Bearing, latest
WARNER & SWASEY #2, Timken, Latest
WARNER & SWASEY #3, #4, #5, Uni., Timken bearing, latest type
WARNER & SWASEY 1A, 4A, Uni., Timken bearing—latest type

MILLING MACHINES—Mfg.

BRIGGS Type 2A, production, HYD, latest type
BROWN & SHARPE #12 auto., Timken—latest
BROWN & SHARPE #000—Timken Bearing, Latest Type
CINCINNATI 4-36 Hydro. Timken Bearing—latest
CINCINNATI #0-8 Vert.—Pl. Auto.—Timken Bearing—latest type—Rise & Fall
CINCINNATI #1-12, #1-18 Plain Auto.—Timken Bearing—latest type
CINCINNATI 48" duplex, automatic, SPD
KEARNEY & TRECKER #1218 Auto.—Timken Bearing—latest type
MOREY #12M 2 spdle. Profiler & Milling Machine
NICHOLAS hand, M.D.—latest type
OHIO Auto. 16"x72" table—Timken Bearing

MILLING MACHINES—Plain

CINCINNATI #3 Hih Speed Dial Type, Timken Bearing, Latest Type
CINCINNATI #2L—Timken Bearing, Latest Type
CINCINNATI #4 Timken Bearing, M.D.
CINCINNATI #4S, #5, high power, M.D.
KEARNEY & TRECKER #3K, Timken—latest
KEMPSMITH #4 Maximiller—Timken—latest

MILLING MACHINES—Univ.

AMES Bench, Timken Bearing, latest type, M.D.
CINCINNATI #2, dial type, Timken—latest
KEARNEY & TRECKER #3H—Timken—latest
ROCKFORD #2B—Motorized
VAN NORMAN #22-L, #36; Timken—latest

MILLING MACHINES—Vertical

BROWN & SHARPE #5—motor drive
CINCINNATI #2, #4—Dial Type—Timken—latest
KEARNEY & TRECKER 2H, 2K, 3H, 3K, 4H, 4K, Timken—latest

PLANERS

CINCINNATI 24" Crank—Motor drive
CINCINNATI 48x48x20', 3 heads, AC, M.D.
CINCINNATI 36x36x8', 2 heads, AC, M.D.
CHANDLER 36x36x20', 4 heads, AC, M.D.
DETRICK & HARVEY 48x48x10', 12', open side
DETRICK & HARVEY 48x48x16', 4 heads, Hyd.
GRAY—48x48x16'—4 heads—A.C.—M.D.
GRAY 54x42x10', 2 heads, AC, M.D.
GRAY 60x48x16', 3 heads, AC, M.D.
HAMILTON 42x42x20', 4 heads, motor drive
LYND FARQUHAR 26" Openside, motor drive
NBP 36x36x10' 3 heads, DC, M.D.
NBP 42x42x12', 2 heads, AC, M.D.
NBP 48x48x14', 16, 2-4 heads, AC, M.D.
NBP 54x54x12', 2 heads, box table, AC, M.D.
NILES 48x48x12'—Time Saver—3 heads, P.R.T., box table, D.C., M.D.—latest type
NILES BEMENT POND 96x80x20' box table, 4 heads, Hyd., PRT—motor drive
OHIO 42x42x20'—2 heads, AC, M.D.
PATCH 48x48x14', 4 heads, DC, M.D.
POND 48x48x16', 2 heads, AC, M.D.

SAWS

BRIDGEPORT #48W Abrasive
CAMPBELL #213, 401, wet abrasive, latest
ESPEN LUCAS #138—Cold Saw, MD
GROB #OS-200 band, latest type
MOTCH & MERRYWEATHER #3 Cold Saw—Hyd.—latest type
PEERLESS 14x14 Hack; latest type

SHAPERS

CINCINNATI 28" Travel Head—2 head Type B
COCHRANE BLY Univ. Vert. Shaper-Miller; M.D.
LAMAIRE 18' Vert. Hydraulic—latest type
MOREY 10", 14" Vertical—latest type
NEWTON 15" vert. slotter, DC, M.D.
NILES 18" ver. slotter, DC, M.D.
PRATT & WHITNEY 6', 10" Vertical, Motor drive
ROCKFORD 24" Hyd.—latest

THREAD MILLING MACHINES

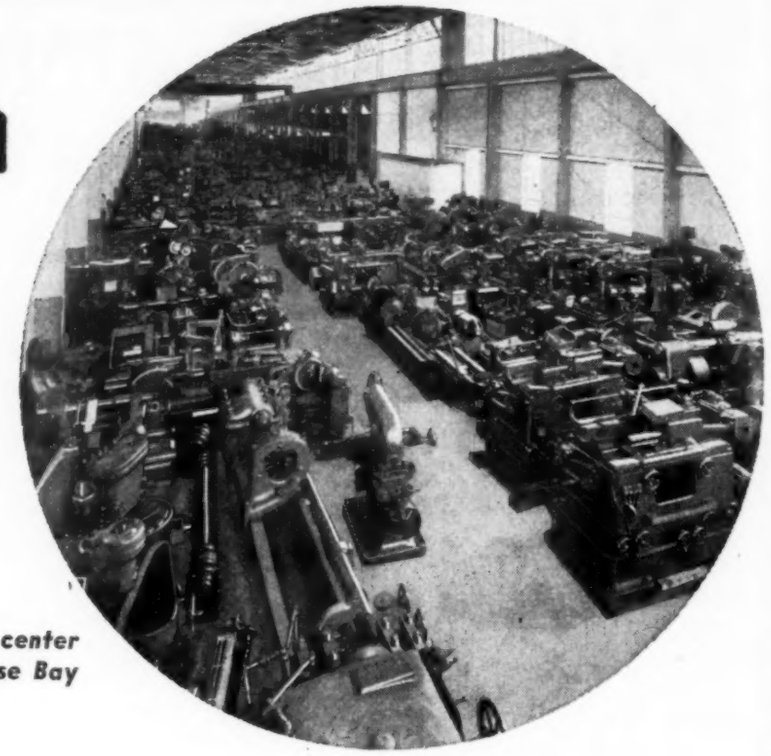
MOREY SHIELDS 12x120, 12x192—latest type
PRATT & WHITNEY 4½x12, Model C—latest
PRATT & WHITNEY 6x132—motor drive
SMALLEY General #20 MB, Motor Drive

MISCELLANEOUS

BARNES #2—single spindle—hone—Latest Type
BAUSH Radial Tapper—latest
BILLINGS & SPENCER 200, 400, 800 lbs. board drop hammer, latest type
FERRACUTE No. DG55, Drawing, latest type
GENERAL ELECTRIC 100KW Generator
LANDIS ¾" Bolt Threader—latest
LaPOINTE #3L Broach, horiz. hyd. 15 ton cap.
LeBLOND #2 horiz. Hone SS, latest type
LeBLOND #2 deep hole borer, latest type
MORTON 60" Combination traveling head planer, milling and drilling motor drive
NILES 30"x50' deep hole borer, Timken—latest
PRATT & WHITNEY 3-B Jig Borer—Latest Type
SHUSTER #1 Wire Straightener
TREADWELL 12"—Pipe Threader—Motor Drive
WHITON 8x108 centers duplex centering, M.D.
YATES AMERICAN J-70, Woodworking, Latest
YODER Multiple tube cutting machine—latest

Eastern

CAN SHIP FROM STOCK!



View of center Warehouse Bay

AUTOMATICS

No. 4D Potter & Johnston, m.d.
No. 6A Potter & Johnston, m.d.
No. 6C Potter & Johnston, m.d.
14" Fay Automatic, Flanders Type, m.d.
20x25" Jones & Lamson Automatic, m.d., latest type, for center work
4 spindle 7/8" Cleveland Model M, m.d.
4 spindle 2 1/4" Cleveland Model K, m.d.
4 spindle 2" Cleveland Model M, m.d.
2 1/4" Cleveland Model A, m.d.
2 1/2" Cleveland Model A, m.d.
2 1/4" Gridley Single Spindle, m.d.
4 1/2" Cleveland Model A, m.d.
5 1/2" Cleveland Model A, m.d.
5 1/2" Cleveland Model A, m.d.
6" Cleveland Model A, m.d.
7 3/4" Cleveland Model A, m.d.

HORIZONTAL BORING MILLS

No. 45 Giddings & Lewis, 4 1/2" bar, m.d
No. 0 Giddings & Lewis, m.d., 3 1/8" bar
No. 31 Lucas, m.d., 3" bar
No. 21 Lucas, m.d., 2 1/2" bar
No. 32 Giddings & Lewis, m.d., 3 1/8" bar
4" bar Detrick & Harvey Floor Type, m.d.
4" bar Landis Floor Type, m.d.
4" Niles Horizontal, m.d.
4 1/2" Niles, m.d.
5 1/2" bar Niles Table Type, m.d.
6" bar Niles-Bement-Pond Floor Type, m.d.
10" bar Sellers Floor Type, m.d.
60" stroke Morton Boring Mill and Traveling Head Planer, m.d.

BROACHING MACHINES

VAS-5-42 Colonial Single Ram Hydraulic, m.d., latest
Cincinnati Mill Broach, m.d., 10" spindle, new
No. 75 H.P. LaPointe Horizontal Hydraulic, m.d., normal pull 37 1/2 tons, maximum stroke 150", latest type
No. 4 LaPointe of Hudson, gear box

VERTICAL BORING MILLS

36" Bullard Spiral Drive, with side head, m.d.
24" Bullard New Era, m.d., with side head
24" Bullard Spiral Drive, m.d., side head
36" Bullard New Era, m.d., side head
42" Bullard New Era, m.d., side head
42" Colburn H.D., m.d., 2 swivel heads
48" Cincinnati Rapid Production, m.d., 1 turret, 1 swivel head
48" Putnam H.D., m.d., 2 swivel heads
53" Niles, m.d., 2 swivel heads
54" Bullard Spiral Drive, m.d., side head, latest
54" Colburn, m.d., 1 turret, 1 swivel head
72" Colburn, m.d., 2 swivel heads
84" Niles, m.d., 2 swivel heads
100" Niles, m.d., 2 swivel heads

MULTIPLE SPINDLE DRILLS

No. 3 Baush, m.d., 16x30" head, 15 spindles
No. 3 Baush, m.d., 20x40" head, 15 spindles
3 spindle 12" Rockford Gang, m.d.
4 spindle Foote-Burt Rail Drill, m.d.
No. 16 Fixed Center Foote-Burt, m.d.
2 spindle No. 262 Barnes All Geared Self-Oiling, m.d., latest

UPRIGHT DRILLS

No. 1L—21" Cincinnati-Bickford Super-Service, m.d., new
24" Barnes All Geared Self-Oiling, m.d.
24" Cincinnati-Bickford Upright, m.d.
28" Cincinnati-Bickford, gear box
30" Rich H.D., m.d.
32" Aurora, belt
H3 Barnes Hydram, m.d.
D4 Colburn H.D., m.d.
D8 Colburn H.D., s.p.d.
No. 25 Foote-Burt H.D., s.p.d.
No. 36 H.O. Baker H.D., m.d, 40" circular table, latest

TURRET LATHES

No. 1 Cincinnati-Acme Semi-Universal, m.d., chucking
No. 1L Gisholt Universal, m.d., Timken, hardened ways, chucking
No. 1A Warner & Swasey Universal, m.d., preselector head, chucking, latest
No. 1A Warner & Swasey Universal, m.d., chucking
No. 1A Warner & Swasey Universal, m.d., bar
No. 2 Cincinnati Acme Full Universal, m.d., chucking, Timken latest
No. 2 Warner & Swasey Geared Head, m.d., latest
No. 2B Foster Universal, m.d., chucking
No. 2L Gisholt Universal, m.d., Timken, hardened ways, chucking
No. 2L Gisholt as above, long bed type
No. 2C Norey Ram Type, m.d., bar
No. 2 Pratt & Whitney Shaver, m.d.
No. 2A Warner & Swasey Universal, m.d., preselector head, bar, latest
No. 2A Warner & Swasey Universal, m.d., preselector head, chucking, latest
No. 2A Warner & Swasey Universal, m.d., bar, late
No. 2A Warner & Swasey Universal, m.d., chucking, late
No. 3S Cincinnati Acme Fixed Center Universal, m.d., automatic chuck, latest
No. 3 Cincinnati Acme Universal, m.d., chucking
No. 3 Foster Geared Head, m.d., auto. chuck
No. 3L Gisholt, m.d., chucking
No. 3L Gisholt, m.d., chucking, cross sliding turret
No. 3L Gisholt, m.d. ,long bed type
No. 3 Warner & Swasey Ram Type, m.d., bar, latest
No. 3A Warner & Swasey Universal, m.d., bar
No. 3A Warner & Swasey, m.d., chucking
No. 3A Warner & Swasey, m.d., bar, latest type
No. 3A Warner & Swasey, m.d., chucking, Timken
No. 3B Foster Universal, m.d., bar
No. 4 Cincinnati Acme Ram Type, m.d., bar
No. 4 Gisholt Ram Type, m.d., chuck, latest
No. 4 Warner & Swasey Universal, m.d., preselector head, bar, latest
No. 4 Warner & Swasey Universal, m.d., preselector head, chucking, latest
No. 4 Warner & Swasey, cone motorized, chucking
No. 4 Warner & Swasey, cone motorized, bar
No. 4 Warner & Swasey Universal Geared Head, m.d., chuck
No. 4A Warner & Swasey Universal, m.d., Timken, chucking
No. 5 Jones & Lamson Universal Ram Type, m.d., chucking
No. 7 Bardons & Oliver Universal Ram Type, m.d., chucking
2 1/2x24" Jones & Lamson Geared Head, m.d., bar
2 1/2x24" Jones & Lamson Geared Head, m.d., chucking
2 1/2" Jones & Lamson Universal Saddle Type, m.d., bar, latest
3x36" Jones & Lamson Geared Head, m.d., bar
3x36" Jones & Lamson Geared Head, m.d., chucking
2 spindle 3x36" Jones & Lamson Flat Turret, m.d., chucking
3 1/4" Cincinnati Acme Geared Head, m.d., chucking
3 1/4" Cincinnati Acme Geared Head Flat Turret, m.d., bar
3 1/2x32" Jones & Lamson Geared Head Flat Turret, m.d., chucking
3 1/2x32" Jones & Lamson Geared Head Flat Turret, m.d., bar
18" Libby Type A Turret, m.d., chucking
20" Acme Plain Turret, cone
Woods Tilted Turret Model D, cone
24", 28" Gisholt, cone

RADIAL DRILLS

6'-15" Cincinnati-Bickford Super-Service, m.d. on arm
3' American Triple Purpose, m.d. on arm, 11" col.
3' American Sensitive, belt
3'-11" Carlton, m.d. on arm, latest
3' Fosdick Sensitive, belt
4'-11" American Hole Wizard, m.d. on arm, latest
4'-11" American Triple Purpose, m.d. on base
4'-13" Carlton Plain, m.d. on base
4'13" Cincinnati-Bickford, gear box on base

THE EASTERN

MELROSE 1241 **1004 TENNESSEE AVENUE**

4'-13" Cincinnati-Bickford Super-Service, m.d. on arm
4'-12" Fosdick, gear box on base
4' Niles-Bement-Pond Semi-Universal, m.d.
5' American Triple Geared, gear box
5'-17" Cincinnati-Bickford Super-Service, m.d. on arm
5' Cincinnati-Bickford Plate Hole Driller, m.d. on arm
5' Prentice, motorized
6'-15" American Triple Purpose, m.d. on base
6'-17" American Hole Wizard, m.d. on arm, railroad type base, latest
6'-15" Carlton, gear box on base
6' Niles-Bement-Pond Semi-Universal, m.d.
6'-16" Western, m.d.
7'-15" Cincinnati-Bickford, m.d. on base
8'-16" American Triple Purpose, m.d. on arm
10'-22" American Triple Purpose, m.d. on arm

HORIZONTAL DRILLS

No. 1 Pratt & Whitney 2 spindle Deep Hole, m.d., 9'8" bed
No. 1B Pratt & Whitney 2 spindle Deep Hole, 50" cap., latest
No. 1½Bx50" Pratt & Whitney Chambering Machine, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Deep Hole, m.d., latest
Snyder Double End Boring Machine, m.d., latest
Love Bros. Drill No. 4 Taper
6 spindle National Acme Automatic, belt
5 spindle Detroit Semi-Automatic, belt
Pratt & Whitney Rifling Machine, belt
No. 420-2 spindle W. F. & John Barnes Deep Hole, 10' drilling length, latest

GEAR MACHINERY

No. 3 Barber-Colman Precision Hobber, m.d., latest
Type A Barber-Colman, 20" extra length of bed, m.d., latest
No. 12 Barber-Colman Double Overarm, m.d., long bed type
Type T Barber-Colman, m.d., latest type
3" Gleason Straight Bevel Gear Generator, m.d.
8" Gleason Mfg. Type, m.d.
9" Pratt & Whitney Hydraulic Spur Gear Grinder, m.d.
10" Pratt & Whitney Hydraulic Gear Grinder, for spur and helical gears, m.d.
11" Gleason Straight Bevel Gear Generator, belt
12" Gleason Straight Bevel, m.d.
No. 2HS Lees-Bradner Spur & Helical Gear Grinder, m.d.
No. 4—36" Brown & Sharpe Automatic Spur Gear Cutter, s.p.d.
No. 6—60" Brown & Sharpe, m.d.
No. 13LS Fellows Gear Lapper, m.d.
New Lapping Heads for Fellows (10 in stock)
No. 34 Brown & Sharpe Spur Gear Hobber, m.d.
No. 24H Gould & Eberhardt Spur Gear Hobber, m.d.
No. 44 Brown & Sharpe Spur & Spiral Gear Hobber, m.d.
48" Cleveland Hobber, m.d.
No. 7A Fellows H.S. Gear Shapre, m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 61A Fellows Gear Shaper, m.d., latest type
No. 64-S Fellows Gear Shaper, m.d., latest
No. 615A Fellows Gear Shaper, m.d., latest
No. 645A3 Fellows Gear Shaper, m.d., latest
No. 71A Fellows H.S. Gear Shaper, m.d.
Cincinnati Gear Burnisher, m.d.
Gleason Spiral Bevel Gear Rougher, s.p.d.
Schuchardt & Schutte Gear Tooth Rounder, belt

CENTERLESS GRINDERS

No. 2 Cincinnati, m.d., 1945 machine, brand new
No. 2 Cincinnati, m.d., 1942 machine, slightly used
No. 2 Cincinati, m.d., older types (10)
No. 3 Cincinnati, m.d., 1945 machine, brand new (2)
Cincinnati Valve Seat Grinder, m.d.

SURFACE GRINDERS

No. 11 Blanchard, m.d., 16" rotary chuck, latest
Builders Iron Fdry. Co. Surface Grinder, 8x4" chuck, m.d.
14" Pratt & Whitney Vertical, m.d., 10x34" chuck
16" Arter Rotary surface Grinder, m.d., new, latest type
22" Pratt & Whitney Vertical, m.d., 84x14½" chuck
No. 16 Blanchard Vertical, m.d., 26" chuck
No. 18 Blanchard Vertical, m.d., 30" chuek, latest type
No. 25A—16" Heald Rotary Surface, m.d., latest type
No. 25A—24" Heald Rotary Surface, m.d., latest type
No. 33 Abrasive Vertical, m.d., 18x6" chuck
Baldwin-Tuthill Knife Grinder, 75" knives
54" Bridgeport Knife Grinder, belt

INTERNAL GRINDERS

No. 172 Heald Gap Plain, m.d., brand new, latest type
No. 6 Bryant, belt
No. 9 Cincinnati, belt
No. 10 Bryant, belt
No. 16RS Bryant, m.d., latest
No. 16A—16" Bryant, m.d., latest
No. 16—22" Bryant Hydraulic Hole, m.d., latest
No. 20 Bryant, belt
No. 24—21" Bryant Hydraulic, m.d.
No. 49 Heald Single End Borematic, m.d.
No. 72A3 Heald Plain Internal, m.d.
No. 72A3 Heald Sizematic, m.d.
No. 72A3 Heald Gagematic, m.d.
No. 73 Heald Airplane Cylinder, m.d., brand new, lateset type
No. 74 Heald Internal, m.d., latest

UNIVERSAL CYLINDRICAL GRINDERS

12x36" Cincinnati Universal, 3 motor drive
No. 13 Brown & Sharpe, m.d., latest
No. 2—12x30" Brown & Sharpe, belt
12x30" Landis Hydraulic, m.d.
12x36" Cincinnati, belt
16x68" Landis, belt

PLAIN CYLINDRICAL GRINDERS

3x18" No. 5 Brown & Sharpe, m.d., latest type
6x18" Cincinnati Hydraulic, model EA, m.d.
6x18" Landis, m.d.
6x32" Ficthburg Type A, m.d., latest
8x36" Cincinnati Saddle Type, m.d.
10x24" Landis, m.d.
10x36" Cincinnati, model EA, m.d., hydraulic
10x48" Brown & Sharpe, belt
10x48" Landis Type C Hydraulic, m.d., latest
10x72" Landis, m.d.
No. 10 Brown & Sharpe Self-Contained, m.d.
No. 11 Brown & Sharpe Self-Contained, m.d.
12x36" Landis, m.d.
12x36" Modern, belted m.d.
12x48" Cincinnati Self-Contained, m.d.
12x48" Modern, belted m.d.
12x72" No. 16 Brown & Sharpe, belt
12x96" Landis, m.d.
14x18" Cincinnati Self-Contained, m.d.
14x48" Cincinnati Self-Contained, m.d.
14x52" Norton, motorized
16x72" Landis, m.d.
16x216" Landis Type B, m.d., latest
20x120" Landis Self-Contained, m.d.
26x96" Landis Self-Contained, m.d.

CYLINDER GRINDERS

No. 50 Heald Hydraulic, m.d., brand new, latest type
No. 55 Heald, m.d.
No. 55 Heald, belt
No. 65 Heald, belt
No. 73 Heald Airplane Cylinder, latest type, brand new, m.d.

ENGINE LATHES

12"x6' Lodge & Shipley Selec. Head, m.d. in base, taper
13x48" Pratt & Whitney Geared Head, m.d. in base, taper
14"6' American Geared Head, m.d., taper
14"x6' Flather, cone
14"x6' Hendey Geared Head, m.d., taper
14"x6' Pratt & Whitney, cone, taper
14"x8' American Geared Head ,m.d., taper
14"x8' Pratt & Whitney, cone
16"x6' Bradford, cone, taper
16"x6' Hendey Geared Head, m.d.
16"x6' Lodge & Shipley Selective Head, m.d.
16"x6' Sebastian, m.d. in base, latest
18"x7' Hendey Geared Head, m.d., taper
18"x8' American Geared Head, m.d., taper
18"x8' Lodge & Shipley, cone
18"x8' Greaves-Klusman, cone, taper
18"x8' Hendey Geared Head, m.d., taper
18"x8' Whitcomb-Blaisdell, Geared Head, m.d.
20"x48" centers Pratt & Whitney Geared Head, m.d., taper
20"x8' Cisco, cone
20"x8' Springfield Geared Head, m.d., taper
21"x12' LeBlond, cone
23"x12' LeBlond Geared Head, m.d., taper
24"x10' American Geared Head, m.d., taper
24"x10' Lodge & Shipley Selective head, m.d.
24"x10' Hendey Geared Head, m.d.
24"x10' Whitcomb-Blaisdell, cone
25"x10' LeBlond, cone
27"x16' LeBlond, cone, taper
30"x12'6" Niles-Bement-Pond, m.d., taper
30"x13'6" Niles-Bement-Pond, m.d.
30"x26' Lodge & Shipley Selective Head, m.d., 2 carriages
32"x16' Bridgeford Geared Head, m.d., taper
36"x10' Putnam, cone, motorized
36"x12' Lodge & Shipley Selective Head, m.d.
36"x12' Wright, cone
36"x21' centers Putnam Geared Head, m.d.
36"x28'6" bed Niles H.D., m.d., latest
36"x30' Lodge & Shipley Selective Head, m.d., 2 carriages
36"x32' Centers Putnam Geared Head, m.d.
36"x28' centers Niles H.D., m.d., latest
48"x204" centers LeBlond H.D., m.d., latest type, taper

MANUFACTURING LATHES

No. 9 Heavy LeBlond Multi-Cut, m.d.
3x80" LoSwing, s.p.d.
3½x36" LoSwing, s.p.d.
4x60" LoSwing, m.d., hardened ways, latest
8x84" LoSwing, s.p.d.
8x132" LoSwing, m.d., latest
9x12" Sundstrand Mfg., s.p.d.
9x14" Porter-Cable Mfg., m.d.
11x28" Reed, m.d.
13x24" Coulter Automatic Threading, m.d.
13x96" Automatic Threading, m.d.
15"x6' Automatic Threading, belt
16"x6' Cincinnati Mfg., m.d. in base
17x124" centers LeBlond Rapid Production, m.d. in base, latest
20"x8' LeBlond Mfg., m.d.
20"x16' American Geared Head, for spindle boring
32"x12' Gray Plain Turning, motorized
Niles-Bement-Pond Quartering Machine, new
No. 4 R. K. LeBlond Boring Lathe, 37' bed, 14'4" boring length, 15" hole in spindle, m.d., latest type (1945)

VERTICAL MILLING MACHINES

No. 3V Van Norman, m.d. in base, latest, pract. new
No. 2 Brown & Sharpe, s.p.d.
No. 2M Cincinnati, m.d.
No. 2 Cincinnati H.P., m.d.
No. 2H Milwaukee, m.d. in base, latest type
No. 2K Milwaukee, m.d. in base, latest type
No. 2½B Milwaukee, s.p.d.
No. 3 Cincinnati, m.d.
No. 3 Cincinnati, m.d. in base
No. 3B Milwaukee, m.d. in base
No. 3B Milwaukee, s.p.d.
No. 3V Toledo, s.p.d.
No. 4 H.P. Cincinnati, m.d., latest
No. 4 H.P. Cincinnati, m.d.
No. 4 Milwaukee, m.d.
No. 4H Malwaukee, m.d. in base, latest type
No. 4K Milwaukee, m.d. in base, latest type
No. 5 Brown & Sharpe, cone
No. 5 Jackson, m.d.
No. 5 Reed-Prentice, m.d., latest type
No. 6 Becker, cone
No. 28-60 Cincinnati 2 spindle Vertical Hydro-Tel, m.d., latest type

PLAIN MILLING MACHINES

No. 000 Brown & Sharpe, m.d., latest
No. 1M Cincinnati, m.d.
No. 1A Milwaukee Mfg., m.d. in base
No. 1½ Cincinnati, cone
No. 2B Brown & Sharpe, m.d. in base, latest
No. 2 Cincinnati, cone
No. 2 Cincinnati High Speed Dial Type, m.d. in base, latest
No. 2MH Cincinnati, m.d. in base, latest
No. 2HL Milwaukee, m.d. in base, latest
No. 3B Brown & Sharpe, m.d. in base, latest
No. 3B Brown & Sharpe, m.d.
No. 3S Cincinnati, m.d.
No. 3 Kempsmith, cone
No. 4 Cincinnati H.S. Dial Type, m.d. in base, latest
No. 4 Cincinnati H.P., m.d.
No. 4B Brown & Sharpe, m.d.
No. 4 Cincinnati, s.p.d.
No. 4S Cincinnati, m.d.
No 5 Cincinnati, rect. overarm, m.d., latest
No. 5 Cincinnati, m.d., rect. overarm
No. 5B Heavy Brown & Sharpe, m.d.
No. 5B Heavy Brown & Sharpe, s.p.d.
No. 5 Heavy LeBlond, s.p.d.

UNIVERSAL MILLING MACHINES

No. 2L Cincinnati, m.d. in base, latest
No. 3S Cincinnati, s.p.d.
No. 4A Brown & Sharpe, m.d.

MANUFACTURING TYPE MILLING MACHINES

No. 0-8 Cincinnati Model EA Plain Automatic, m.d., brand new
No. 00 Sunstrand Hydraulic Feed Rigidmill, m.d., latest
No. 1-12 Cincinnati Plain Automatic, m.d. in base, latest
No. 2-24 Cincinnati Plain Automatic, m.d. in base, latest

MACHINERY COMPANY

CINCINNATI, OHIO

Cable Address: EMCO

MODERN EQUIPMENT NOW AVAILABLE

Call "KINGS COUNTY" *of Brooklyn*

NEW — SPOT DELIVERY — POWER PRESSES

MAKE	TO	STROKE	TYPE
(15) V & O #0	5	2"	OBI—Dial Feeds
(15) V & O #2	17	4"	OBI—Dial Feeds
(15) Wat-Farrel	25	3" up—3" down	C Frame—dbl action, dial feeds

SAWS
Kalamazoo Metal Cutting Band Saws, horizontal
SHEARS (Foot) Frederick complete 36" x 10 G cap.
(Power) Frederick complete with motor, gauges, 10' x 18 G
BRAKES Press type, a 11 steel, Lynn Hydraulic, motor self contained, gauges 52" x 14 G

USED POWER PRESSES

MAKE	TONS	STROKE	DIE SPACE	SHUT	TYPE
(6) Wat-Farrel	7½	1½"	8½" x 12"	6"	SS, Single action, C Gap frame
Bliss #18	10	1½"	8½" x 14½"	7"	CVI Geared
Max Ames	15	2"	9" x 18½"	6"	OBI—Roller Feed 3" x 2"
Perkins # 350B	20	2"	12" x 20"	9"	OBI—Serial #14370
Bliss #172A	22	1½"	5" x 4"	7"	End Wheel
Bliss #20	30	3"	14" x 22"	8"	OBI
Bliss #68C	35	1-2½"	21" x 10½"	7"	Arch-DA
(3) Mystic #5A	40	6"	14" x 17"	14"	Embossing & Molding for Plastics
Torrington	40	1-2"	23" x 16"	6½"	SS-DA
Bliss #1B	43	3-6"	14" x 26"	8½"	SS-DA, Gap
(2) Bliss #52	45	2"	14" x 15"	9½"	SS-DA
Wat-Farrel	50	Eyelet			6 Plunger
Consolidated #54	60	3"	18" x 18"	12"	Trimmers—Shear
Bliss #57	75	2"	18" x 18"	11"	SS-Trimming
(2) Bliss #7	180	1½"-4½"	28" x 36"	15"	SS-DA, Geared, Air Clutch
Toledo #59½S	500	8"	31" x 31"	29"	SS-DA, Twin Drive
Lake Erie Hydraulic	1320	36"	80" x 60"		Pump and Motor 1943
Lake Erie Hydraulic	2500	36"	133" x 120"	42"	Pump and Motor 1944

BRAKES—Press, Geo Ohl 10½' x 10 Gauge, motorized
Press, D & K, apron type, 8' x 16 g, power
GRINDERS—Crankshaft, Landis 16" x 48"
RIVET COUNTERSINKING MILL—Farnham 36" reach
SHEARS—Power, Bliss 42" x 11 g, Bliss 24" x 3/8, American 12' x 3/8, Niagara—5' x 14 g.

(7) TURRETS—Denver 6" motor in base air chuck, late
WELDERS—Spot—Ace 30 KVA 36" reach
Arc—Hobarts 150-250 Amp.
Arc—Lincoln 150 Amp.
Arc—Wilson 200 Amp.

Wat-Farrel Eyelet 6 Plunger Transfer Press
Cap. 56 ton, Stroke 1¾"
Center to Center 4"
Shut 5½" Feed Roll Cap 2½"
Weight 5400 lbs. Like new
Delivery—Immediate

(2) Bliss #7 (1943) 180 ton—Double or Single Action
Strokes 1½" and 4½"
Die Space 28" x 36" f to b—r to l
Inside Ram 10" x 15"
Bolster 4½"—Twin Geared Air Clutch
Automatic Roller Feed and Cutoff
Motorized 25 HP 3 phase AC and controls
Weight 37,000 lbs. Like new—Delivery—Immediate

FOR SPEEDY DELIVERIES — WIRE — PHONE — WRITE

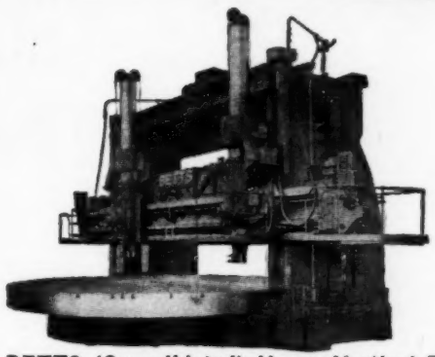
KINGS COUNTY MACHINERY EXCHANGE

394 ATLANTIC AVENUE, BROOKLYN 2, N. Y.

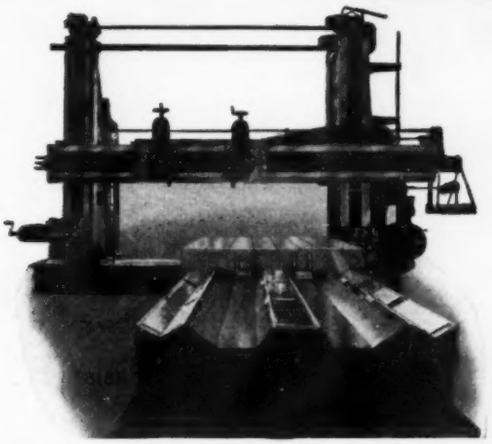
PHONES: TRIANGLE 5-5212, 5-5213, 5-5237

MDNA MEMBER

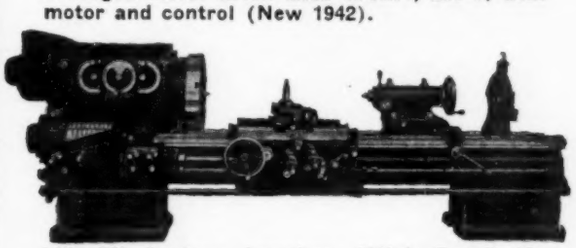
KEEP POSTED WITH SIMMONS



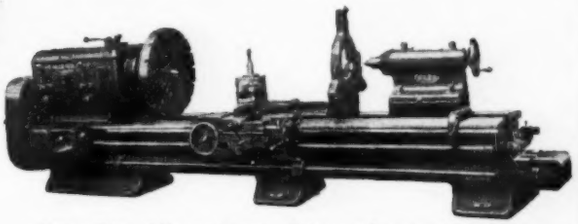
14' BETTS (Consolidated) Heavy Vertical Boring and Turning Mill, with two swivel heads, arranged motor drive with 40-H.P., 230-V, D.C. motor and control (New 1942).



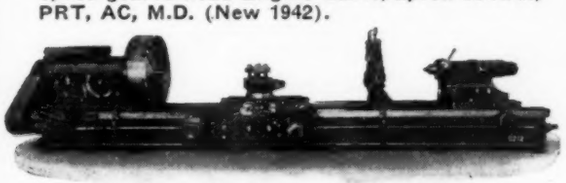
8'6"/14' x 35' Detrick & Harvey Convertible Openside Planer, with Three Ways and Double Drive. 100-HP, 230 V, DC Reversing Type Planer Motor and Control. 4-Heads.



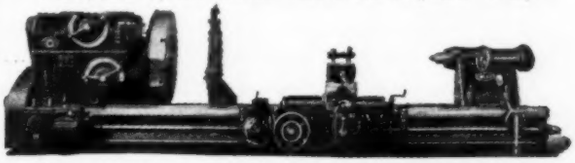
24" x 26' Centers American "High Duty" 12-speed geared head Engine Lathe, apron control, PRT, AC, M.D. (New 1942).



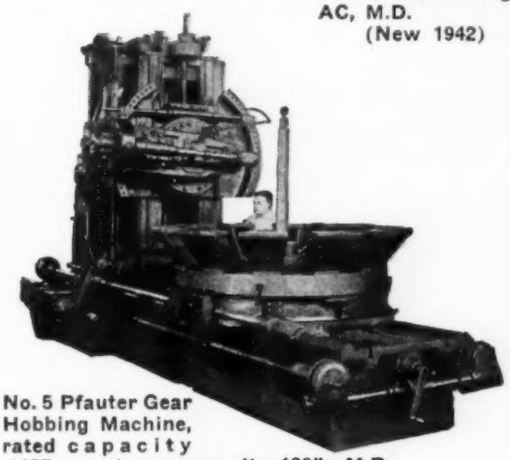
36" x 32' (24' centers), Niles (General Machinery) "TIMESAVER" Engine Lathe. 12-speed geared head, PRT, Taper Attachment to one of the two carriages. AC, M.D. (New 1942)



48" x 40' (30' centers) Simmons Heavy Geared Head Engine Lathe, with two carriages and PRT, 230 V, DC motor and control (New 1942).



48" x 45' (35' centers) Niles (General Machinery) Heavy Engine Lathes. 16-Speed Geared Headstock, Two Carriages with PRT, AC or DC, M.D. (New 1942).
Also available 60" x 31' (20' centers) Niles, 16-Speed G.H. Lathe (New 1942).



No. 5 Pfauter Gear Hobbing Machine, rated capacity 118"; maximum capacity 130"; M.D.

Write today for Complete Current Stock List of Simmons Engineered Rebuilt Machine Tools.

ENGINEERED Machine Tool REBUILDING

SIMMONS MACHINE TOOL CORPORATION

Main Office & Plant: 1759 N. Broadway, Albany 1, N. Y.

New York Office: 50 E. 42nd Street

SIMMONS *Engineered* REBUILDING

O'BRIEN prestige is far-reaching. We are proud to enjoy the confidence of customers all over the world. And one of the chief reasons for this popularity is the O'BRIEN policy of guaranteed satisfaction. O'BRIEN insists that every piece of machinery—industrial, steam driven, metal working or electrical—is exactingly tested, thoroughly rust-proofed and properly boxed before shipment. Every precaution is taken to insure that all shipments arrive in the same excellent condition that they were in when they left the O'BRIEN Warehouses and Plants in Philadelphia.

O'BRIEN's large warehouse stocks of every type of machinery—"from a pulley to a powerhouse"—plus modern full-equipped shops and an experienced staff of graduate engineers, expert electricians and mechanics, provide you with the type of service that merits your consideration. Your inquiries will receive our prompt and courteous attention.

LARGE WAREHOUSE STOCKS OF NEW AND GUARANTEED REBUILT MACHINERY

POWER PLANT EQUIPMENT
Turbo Generators—Engine Generators—Boilers—Diesel Engines—Blowers—Motor Generator Sets—Electric Motors—Air Compressors—Pumps—Heaters—Complete Power Plants

METAL WORKING MACHINERY
Lathes — Shapers — Milling Machines — Grinders — Planers — Drill Presses — Pipe Machines — Punches — Shears — Welders — Presses — Forging Equipment

MANUFACTURERS AND DISTRIBUTORS
RED LINE
INDUSTRIAL PRODUCTS

Everything from a Pulley to a Powerhouse

THE O'BRIEN MACHINERY CO.
T.M. REGISTERED U.S. PATENT OFFICE

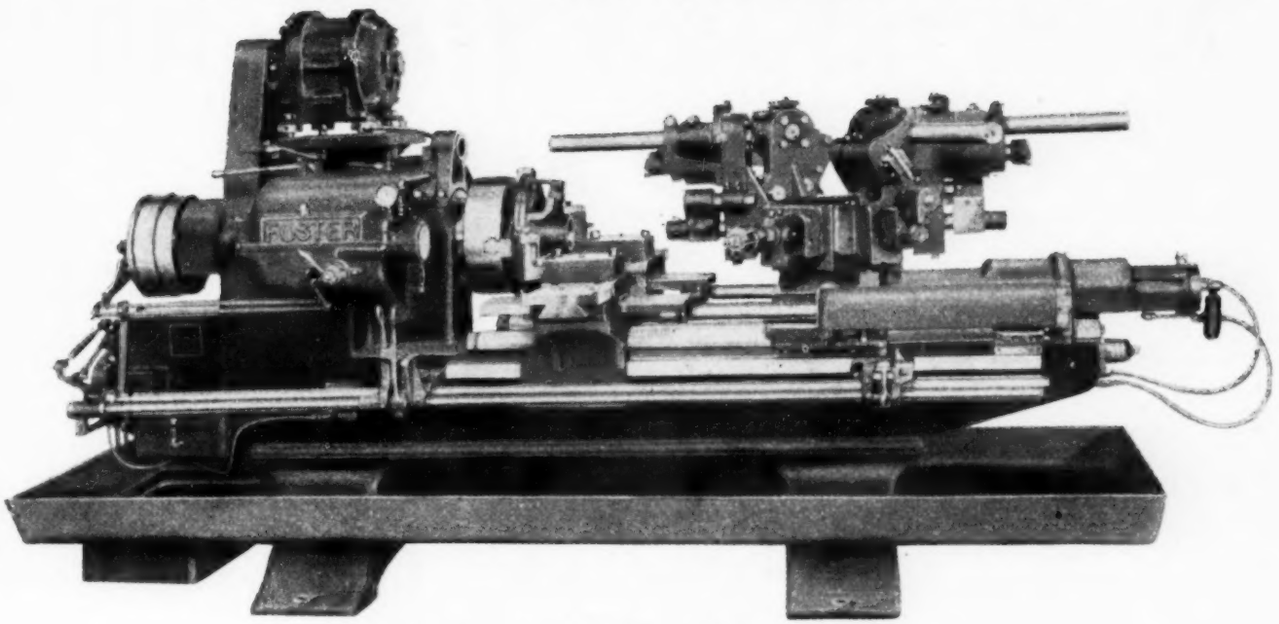
Telephone: MArket 7-4180 — PHILADELPHIA'S LARGEST MACHINERY DEALERS AND EXPORTERS — Cable Address: OBRIEN PHILA

113 NORTH THIRD STREET • PHILADELPHIA 6, PA., U. S. A.

AFFILIATED WITH
SOC EXPANSÃO INDUSTRIAL SUL AMERICANA LTDA
RIO DE JANEIRO — BRASIL

AT OUR PRICES YOU CAN AFFORD A

FASTERMATIC



3-F • 4-F FOSTER

FASTERMATICS

TURRET TYPE — Slightly Used

With these machines, at our prices, you can machine your parts faster, cheaper, accurately. Simple to operate. No skilled operators required. Ready for operation. No waiting for motors—they are on the machines now. Many tools are with these machines—no extra cost. Check with the manufacturer or we can show you how to cut your costs and increase your output with these machines.

ARE YOUR JOBS SIMILAR TO THESE:

Gear Blanks, Bearing Sleeves, Shafts, Large Sprockets, Ring Gears, Retainer Rings, Steel Hub Caps, Cylinders, Chuck Bodies, Bell Housings, Fly Wheels.

★

SPECIFICATIONS

	3-F	4-F
SWING		
Over bed	27 1/2	35
HEAD		
No. of spindle speeds	12	12
Dia. hole thru spindle	3 3/4	5 1/8
Center of spindle to top of ways	11 1/2	13 1/2
CROSS SLIDE		
Width of cross slide	9	10
Length of cross slide	19 1/2	25
Max. travel-cross	3 5/8	6
TURRET		
Dia. across flats	15	20
Dia. tool holes	3 3/4	5
Max. dist. Sp. nose to tur. face	41 5/8	59 1/2
Effective turning mount	12	18
Width of bed—C to C of Vees	16	24

EMERMAN MACHINERY CORP.

875 W. 120TH STREET — CHICAGO 43, ILLINOIS

"1947"

BEGIN THE NEW YEAR WITH A HASCO BARGAIN

SPECIAL BUYS TO START THE NEW YEAR

UM 6421H—Special
CINCINNATI 6" x 18" Plain Cylindrical Grinders, Motor Driven, New 1937
$1150.00

C5110—IN STOCK
PRATT & WHITNEY Rotary Surface Grinder, 8" Chuck, Motor Driven
$825.00

C-5136—BARGAIN
CINCINNATI #4 Plain Horizontal Miller, Rectangular Overarm, Motor Driven
$3150.00

OTHERS

UM6421L—HEALD #172 Internal Grinding Machine, Motor Driven

UM6421S/T—NORTON 14" x 36" Plain Cylindrical Grinding Machines

UM6531—ABRASIVE #3 Automatic Surface Grinder

C5178—BARNES #249 Motor Driven Honing Machine

UM6467—PRATT & WHITNEY 13"x30" Geared Head Engine Lathe

UM6421AM—CINCINNATI #3 Plain Milling Machine, Rectangular Overarm, All Geared, Motor in Base

UM6551—VAN NORMAN #6 Duplex Milling Machine

UM6421AN/AP—KEARNEY & TRECKER #1404 Simplex Milling Machines

UM6488/9—BARDONS AND OLIVER #2 Electric Turret Lathes, Late Type

UM6492—GISHOLT #3 Turret Lathe, Motor Driven. Late Type

HASCO Machinery Company

HASCO MACHINERY COMPANY
INSPECT OUR WIDE VARIETY OF STOCK
COMPARE OUR ATTRACTIVE PRICES
WRITE • WIRE • PHONE
661-671 FRELINGHUYSEN AVE., NEWARK 5, N. J.
BIGELOW 3-3486-7-8

AUTOMATICS

7/8"-1 1/8" Cleveland 4-spindle
7/8" and 2" Cleveland, Model B
No. 454 New Britain chucking
12" x 63" & 14" x 19" Fay chucking
14" x 18" Monarch Magna-Matic

BORING MILLS

24" & 42" Bullard New Era
53" and 100" Niles Bement Pond
60" Colburn
96" Cincinnati
#112C Ex-Cell-O precision
#10D Moline cylinder borer
5" bar Barrett cylinder borer

BROACHES

Twin-10 and XB-12 Oilgear duplex
#2S & HP50 LaPointe
#3XA Oilgear
30 ton #V-48 American vertical
#3J. N. LaPointe double

GEAR CUTTERS

8H, 12H & 16HS Gould & Eberhardt
#312 & Model T Barber Colman
Nos. 1 & 5A Lees Bradner
No. 130 Cleveland Rigidhobber
36" & 64" G & E auto. spur
48" Cincinnati auto. spur
#7 Fellows gear shaper
11" Gleason straight bevel
15" Gleason spiral bevel
18" Gleason lappers and testers

GRINDERS

Nos. 2 & 3 Cincinnati centerless
4" x 12" type H Landis
6" x 18" type C Landis
6" x 18" #10 B & S
6" x 18" Norton semi-auto.
10" x 24", 16" x 36" & 16" x 72" Landis
10" x 18", 10" x 50" Norton
#72A3 & #75A Heald
#72A3 Heald sizematic
#104 Rivett internal
Grenby precision internal
#115 Gardner double disc
53" #24 Gardner disc
Nos. 10 & 16 Blanchard rotary surface
16 & 24" #25A Heald rotary surface
#2 Brown & Sharpe surface
#3 Abrasive surface

LATHES, ENGINE

14" x 6' Hendey toolroom
14" x 6', 16" x 6' and 16" x 8' American
18" x 8' Springfield
22" x 96" centers Monarch
36" x 16' Bridgeford

LATHES, TURRET

24" & 42" Bullard vertical
Nos. 5 & 3B Foster universal
#4 & 5 Warner & Swasey universal
Nos. 3, 4 & 5 Gisholt universal
Nos. 3 & 5 Jones & Lamson universal

MILLERS

Nos. 2H, 3H, & 4H Kearney & Trecker vertical
No. 4 Cincinnati high power vertical
Nos. 4/36, 4/48, 5/48, & 5/60 Cincinnati hydromatic
12" & 18" Cincinnati plain manufacturing
#2-20 Kent Owens hydraulic
30", 42" & 84" Ingersoll rotary
4" Pratt & Whitney spline
#4 Lees Bradner universal thread
Type C Lees Bradner thread
Type C Hall planetary thread
Ingersoll drum and planer type

PRESSES

1000 ton Lake Erie hydraulic
#10 Bliss straight side
150 ton #661 Toledo coining
12 ton U.S. OBI
#2 Standard screw type

SHAPERS

16" Gemco
20" American
21" Averbeck
24" Gould & Eberhardt
32" Morton draw cut

MILES MACHINERY CO., SAGINAW, MICH.

MACHINE TOOLS FOR SALE AT "DON'T MISS" PRICES!

MILLING MACHINES

Two ATLANTIC Hand Millers, new 1942

3—No. 2 MH Cincinnati Plain Millers, new 1942

No. 3 Cincinnati Plain Miller, s.p.d., all geared feeds and speeds.

No. 4 CINCINNATI Hi-Power, Plain Mill, rect. overarm, Timken Bearings, m.d.

No. 5 CINCINNATI High Power Plain Mill, rect. overarm

Two No. 0-8 CINCINNATI Vertical Mills

No. 2H Kearney & Trekecr Vertical Miller, new 1942

No. 2K Kearney & Trecker Vert. Miller, new 1942

Model 36-V VAN NORMAN Ram-Type Vertical Mill NEW 1942. Table, 64"x14"

8x16" HANSON WHITNEY Univ. Thread Miller, new 1941.

6"x36" Model LT Lees Bradner Thread Miller, new 1942

6"x80" Pratt Whitney Thread Miller

GEAR MACHINERY

No. 72 FELLOWS Gear Shapers, for external and internal spur gears, new 1945.

No. 61-A FELLOWS Gear Shapers, for external and internal spur gears, new 1944.

No. 6 FELLOWS Gear Shaper

3—36" B. & S. Spur Gear Cutter

4—48" B. & S. Spur Gear Cutter

8" BILGRAM Straight Bevel Gear Generator

Three—10" PRATT & WHITNEY Gear Grinders. NEW 1941. For grinding Spur and Helical Gears. Max. outside diam. 10-11/16"

LATHES

14"x6' BRADFORD Lathe, all geared, q.c.g.

20"x8' AMERICAN q.c.g. Lathe, M.D.

Two—Model "Z" MONARCH "MAGNAMATIC" Lathes. NEW 1937. For MASS PRODUCTION of shafts, Swing 14". Center distance 60"

9"x20" LIPE Production Lathe, NEW IN 1941.

TURRET LATHES

No. 3 Warner & Swasey Universal Turret Lathe 1½" bar, new 1942.

Four No. 4 Warner & Swasey Universal Turret Lathes, 2" bar, new 1942

No. 5 Warner & Swasey Universal Turret Lathe, 2½" bar, new 1941.

No. 1A Warner & Swasey Universal Turret Lathe, late type, Timken bearings

No. 1L Gisholt Saddle Type Turret Lathe

Two—3"x32" J&L Flat turret lathes, new in 1935

Three—Model 6.2 DENVER Turret Lathes. NEW 1942. Collet Chuck 6-3/16" capacity

3AL GISHOLT Turret Lathe. GEARED HEAD. Cross sliding turret. Hole thru spindle, 6¼"

Model 1-F FOSTER "FASTERMATIC" Turret-Type Chucking Machine. NEW IN 1937.

GRINDERS

6"x18" Cincinnati Plain Hydraulic Grinder, new 1941

No. 14 (10"x48") B. & S. Cylindrical Grinder

14"x72" Model C Landis Universal Grinder, hydraulic feeds, new 1940

CAPITOL Internal Grinder, Hand feeds

MAJESTIC Internal Grinder, NEW IN 1942

No. 81 HEALD SizeMatic Auto. Internal Grinder, late style. New 1943.

No. 70-A HEALD Internal Grinders, new 1940

No. 72-A-3 Heald Universal Internal Grinder, new 1944. Like new.

No. 72-A-5 Heald Universal Internal Grinder, new 1945. Like new.

Two—Model 16-CP-16" BRYANT Hydraulic Internal Grinders. New in 1941

No. 16 Blanchard Vertical Surface Grinders, 26" magnetic chuck

No. 2 Brown & Sharpe Surface Grinder.

6"x36" NORTON Hydraulic Surface Grinder

No. 4T, 5T and 6T SELLERS Tool Grinders. New 1942. For grinding Lathe and Planer Tools

No. 39 VAN NORMAN Radius Grinder, M.D., new 1940.

PLANERS

48"x42"x14' Cincinnati Planer, two heads.

48"x48"x30' Gray Planer, four heads, M.D.

36"x36"x26' GRAY Planer, 4 heads

LAURENS BROS., INC.

2780 Highland Ave., Norwood

Cincinnati 12, Ohio

MDNA MEMBER

Tel. Redwood 3500

THE OFFICE

THE PLANT

Plan Your Production With Botwinik Machine Tools

USED • NEW REBUILT

With one of the largest supplies in the country always on hand, plus a well-staffed, competent engineering force and a completely equipped plant, Botwinik can fill any or all your requirements for machine tools — new, used or rebuilt.

Our rebuilding department, manned by skilled master mechanics, holds a nation-wide reputation for quality and service — for machines which provide efficient, economical production.

Take advantage of our vast facilities, our huge stock, and expert engineering counsel.

Write, wire or phone your requirements.

BOTWINIK BROTHERS OF MASS., INC.

3 SHERMAN STREET WORCESTER (1) MASS.

"NATIONAL"

MEET YOUR PRODUCTION NEEDS . . . *from one of the most* COMPLETE STOCKS *ever offered the metal working industry.*

"If It's Machinery, We Have It"

POWER PRESSES

TOGGLE DRAW PRESSES

BLISS Nos. 1, 1¼, 3½A, 3½B, 3½C and 4A
TOLEDO 164½

INCLINABLE

BLISS Nos. 18, 19, 19C, 20, 21, 21B and 30 (200 Ton)
FERRACUTE C5
STANDARD Nos. 5S, 8S and 10S
V & O Nos. 00, 0, 01, 1 and 2
ZEH & HAHNEMANN Nos. 36-4

GAP FRAME & DEEP THROAT

BLISS Nos. 2, 3, 4 and 5 End Wheel
BLISS No. 31 Flywheel MD. Inclined
BLISS Nos. 58 and 62 Reducing Presses
BLISS 24" Deep Throat, Geared
BLISS 16, 39 and 40 Horn Presses
BLISS Consolidated No. 73 Geared 6" Stroke
FERRACUTE P2, P3, P4 and PG5
MANVILLE No. 30 with Roll-feeds, and Dial Feeds
MICHIGAN 30" and 36" Deep Throat End Wheel
NIAGARA No. 37
TOLEDO No. 15 and 17 Deep Throat End Wheel
V & O No. 00 High Speed M.D.

DOUBLE ACTION

ADRIANCE No. 44 with Roll Feed & Strip Feed for Bottle Crowns
ADRIANCE 10 DIE BOTTLE CROWN PRESS with Auto. Sheet Feed
BLISS 60C Crank Type
BAIRD No. 3 Tandem with Auto. Roll Feed
V & O No. 10 High Speed
WATERBURY-FARREL 5 Ton High Speed with Auto. Feeds & Scrap Cutter

STRAIGHT SIDE

BAIRD Nos. 2, 3 and 4 with Auto. Feeds
BLISS Nos. 37½, 52, 75½, 76½, 77½ and 78½ (Some with Air Cushion)
BLISS 303½ with Auto. Slide Feed
FERRACUTE Nos. E3 and E4
TOLEDO No. 58¼

DOUBLE CRANK

ADRIANCE & WATERBURY FARREL Perforating with Auto. Roll Feed
BLISS 163A Gap. Type Inclinable
BLISS 6½C—54"x36" with Air Cushion
BLISS 103S—42"x12" with Bottom Slide
NIAGARA 67-C—48"x30" with Spring Cushion
OHL 52" Gang Punching
TOLEDO No. 82B—36"x28"
WEST 48"x24"
WELLS 80" Gang Punching

KNUCKLE JOINT & PERCUSSION

BLISS No. 3K—50 Ton
WATERBURY-FARREL 60 and 320 Ton
ZEH & HAHNEMANN 50 and 150 Ton Percussion

WILLIAMS & WHITE NO. 29U BULL DOZER M.D.

HORNING & WIRING

BLISS Nos. 16, 39 and 40
BLISS No. 2W Wiring

WATERBURY-FARREL PRODUCTION

EYELET PRESSES Nos. 06 and 158
Six Plunger Cut and Carry with automatic Roll Feed
Seven Plunger Transfer Press with automatic Roll Feed
Fifteen Plunger Transfer Press
No. 2½ Cut & Carry with automatic Roll Feed
Dial Feed Presses 5 to 40 ton pressure (20)
Horizontal Redraw Presses for long small diameter shells (6)
Gap Frame with automatic roll feed 5 to 40 Ton (8)

COLLAPSIBLE TUBE EXTRUDING PRESSES

WELDERS

PRACTICALLY NEW FEDERAL 700 KVA PROJECTION TYPE SPOT WELDER, AIR OPERATED.

TAYLOR-WINFIELD THOMPSON & FEDERAL Spot 5 to 30 KVA
THOMSON-GIBB Electric Seam 20 to 150 KVA
THOMSON-GIBB & WINFIELD 5 & 25 KVA Electric Butt

WIRE WORKING

BAIRD, NILSON, and MANVILLE Nos. 1, 2, 3 and 4 Four Slide Wire Formers
BLISS and SLEEPER & HARTLEY WIRE RING MACHINES
SLEEPER & HARTLEY Nos. 0, 1½, 2, 2½, 3, 4 & 5 Universal Spring Coilers
SLEEPER & HARTLEY SPRING LOOPERS & SPRING SETTING MACHINES
WELLS Bed Spring Machinery
SHUSTER, LEWIS & WELLS Auto, Wire Straightening & Cutting Machines, all sizes from 1/32" to ⅞"
SHUSTER Flat Stock Straightening & Cutting Machine up to 1" wide x 12' long
BAIRD Automatic Chain Machines
NATIONAL Automatic Wire Nail Machines
AUTOMATIC BARBED WIRE MACHINE

VAUGHN #10 SINGLE & DOUBLE DECK MOTOBLOCS

WATERBURY FARREL #3 & 4 Bull Blocks
WATERBURY FARREL #1 Step Cone & #1 Straight Roll Wire Drawing Machines for fine wire (some equipped with blocks & some with spooling attach.)
STANDARD TORRINGTON & LANGELIER Wire & Tube Swagers in all sizes
STANDARD & WATERBURY Wire Flattening Rolling Mills with Take-ups

STANDARD #81 TURKS HEAD FOR ROLLING, FLAT & SPECIAL SHAPE WIRE WITH TAKE-UP M.D.

MACHINERY FOR THE MASS PRODUCTION OF WIRE SPECIALTIES SUCH AS WIRE STAPLES, HAIR & BOB PINS, PAPER CLIPS, STRAIGHT & SAFETY PINS, NAILS, WIRE BASKETS, ETC.

ROLLING MILLS

McWILLIAM 3"x5" & 6"x10"
WATERBURY FARREL & UNITED ENGINEERING 6"x14" & 8"x10"
BLAKE & JOHNSON 12"x24"
WATERBURY 12"x12"—2 High Mill Stand

BOLT, SCREW & NUT EQUIPMENT

WATERBURY FARREL & MANVILLE Nos. 0, 1, 2, 3 & 4 Cold Headers (25)
WATERBURY FARREL Nos. 10, 20, 30, 40 & 70 Thread Rollers
WATERBURY FARREL & MANVILLE Rod Headers ¼" & ⅝" Capacity
WATERBURY FARREL & MANVILLE Nos. 1 & 2 Automatic Screw Slotters
WATERBURY FARREL & MANVILLE Nos. 1 & 2 Automatic Nut Blanking Machines
NATIONAL 3/16", ¼", ⅜" & ⅞" Auto. Bent Shank Nut Tappers
AJAX 1¼" Upsetter (Steel Frame)
NATIONAL ½" to 1" Capacity Auto. Bolt Head Trimmers
MANVILLE Auto. Wood Screw Machines

SHEET METAL MACHINERY

POWER SHEARS

NIAGARA & PEXTO 36", 42", 52", 96" & 120" up to ¼" Capacity
CANTON FOUNDRY 11'x14 gauge
ERIE FOUNDRY 10'x¼" Cap. with 24" Gap
CINCINNATI 6'x⅛" Cap. with 24" Gap
PELS Heavy Duty Beam & Channel Shear cap. up to 12" I-Beam at 1 Stroke
QUICKWORK & PETTINGILL Deep Throat Shears
NIAGARA & BLISS Ring & Circle Shears
CAMPBELL Nos. 1, 1B & 2 Nibbling Shears

BLISS AUTO. SHEET STRAIGHTENING & CUTTING MACHINE CAP. UP TO 24" WIDE COILS ADJUSTABLE TO ANY LENGTH M.D.

SLITTERS

BLISS & ADRIANCE 30" Gang Slitters
YODER 24" Gang Slitter with take-up
WATERBURY 48" Gang Slitter ⅜" Capacity
WATERBURY, PEXTO, BETHLEHEM Single Cut Slitters in various capacities and depths of throat

ROLL FORMERS

NEW YODER 12 STAND, CAPACITY UP TO 15" WIDE M.D.

RAFTER 5 Stand Mill
RAFTER 5 Stand Duplex Roll Former. Door Bucks
4—PITTSBURGH 4 Stand Tube Forming Machines

POWER BRAKES

DREIS & KRUMP & VERSON 48"
CINCINNATI 72" & 96"

CAN MACHINERY

CALLAHAN No. 127—⅜S Double Seamers suitable for 5 Gallon Cans and any large containers
BLISS & McDONALD Automatic Strip Feed Presses
NIAGARA No. 9 Double Seamer For Steel Barrels
BLISS & NIAGARA Power Beading & Flanging Machines cap. from tin plate up to 3/16" steel
Complete Equipment for 5 Gallon Square Cans
BLISS & V & O Thread Rollers in all sizes

MISCELLANEOUS

PRATT & WHITNEY (KELLER) No. E2 Duplicator, & Cam Grinder
ROWBOTTOM Universal Cam Miller
HIGH SPEED HAMMER CO. Nos. 1½B, 3A, 4A & 5A Riveting Machines
V & O Nos. 201, & 202½ Thread Rolling & Trimming Machines with auto. feeds
GORTON & DECKER Pantograph Engraving Machines
AMERICAN Hydraulic Broach (Practically New)
BODINE, GARVIN & RICKERT & SHAFER Semi-Auto. & Full Auto. Tapping & Threading Machines
PRODUCTION MACHINERY CO. Auto. Tube Polishing Machines

MACHINE TOOLS

BORING MILLS

CLEVELAND 2½" Bar Table Type
BARRETT 3¼" Bar Table Type
LUCAS #43 Precision—5" Bar Table Type
COLBURN 48" Vertical 2 Heads
BICKFORD 50" Vertical 2 Heads

DRILLS

BAUSCH 12 Spindle Multiple capacity up to 1½"
CANEDY OTTO 4' Radial
CINN-BICKFORD 5' Radial
FOSDICK 3½' Radial

PLANERS

CINCINNATI 36"x36"x16' Box Table 3 Heads
WOODWARD & POWELL 42"x42"x36' 4 Heads
GRAY 42"x24"x8' Widened Pattern 2 Heads
SELLERS 36"x36"x9' 4 Heads
CINCINNATI 36" Stroke Shaper Type with Grinding Attachment
POWELL 36"x36"x8' Heavy Duty

TURRET LATHES AND AUTOMATICS

WARNER & SWASEY Nos. 2, 3A, 4 & 8 Late Type, Fully Equipped
JONES & LAMSON 1½" Bar Cap. Universal, practically new
GRIDLEY 1¼" & ACME 56 Four Spindle Automatics
NEW BRITAIN ⅝" & 1" Six Spindle Automatics

GRINDERS

HEALD No. 22—With 12" Rotary Chuck New 1944 (3)
NORTON 10"x36" Hydraulic Feed Surface
PRATT & WHITNEY 14" Vertical Cup Wheel
BROWN & SHARPE No. 2 Surface
CINCINNATI No. 2 Centerless with all attachments (almost new)

SHAPERS

GOULD & EBERHARDT 16", 20" and 24"
SMITH & MILLS 20", and 24"

LATHES

LODGE & SHIPLEY 24"x14' Geared Head
LODGE & SHIPLEY 20"x8' Quick Change Gears with Taper Attachment
AMERICAN 27"x10' Geared Head T.A.
WALCOTT 26"x12' Quick Change Gear
McCABE 2 Spindle 24"—40"x14'
LEBLOND 36"x12' Quick Change Gear
DRAPER 27"x16' Geared Face Plate Drive
HENDEY 14"x6', 16"x6' Quick Change Gear with Taper Attachments

MILLERS

CINCINNATI Nos. 1, 2, 3 and 4 Plain and Univ. (8)
ROWBOTTOM UNIVERSAL CAM

Our Stock Is Always Changing and We Solicit Your Valued Inquiries

NATIONAL MACHINERY EXCHANGE, INC.

130-136 Mott Street — ***"IF IT'S MACHINERY, WE HAVE IT"*** — **New York 13, N. Y.**

MACHINE TOOLS PRICED TO SELL

FLOOR LATHES

PRACT. NEW TOOLROOM LATHES—NEW 1943
12"x30" Model C Monarch
16x30" Model CY Monarch
22/24½"x17' Lehman (12' bet. centers)
22"x48" Lodge & Shipley

30" AMER., Grd. Hd. Max. swing 40"
24"x12' BOYE & EMMES, Q.C.G.
22"x8' L. & S., Grd. Hd., Q.C.G.
20"x18' HENDEY, Q.C.G., 14' betw. centers
18" MONARCH Q.C.G., 48" betw. centers
16/20"x32" L & S, Grd. Hd., Q.C.G., Motor in Base (2)
16"x6' LEHMANN Hydratrol, Grd. Hd., Q.C.G., M.D.
16"x8' AMER., Grd. Hd., Q.C.G., T.A., M.D. (2)
15"x6' LEBLOND HVY. DUTY, Grd. Hd., Q.C.G., Motor in base
14/16x30" MONARCH Helical Geared Hd.
14"x8' SPRINGFIELD, 12 Speed Grd. Hd., Q.C.G.
14"x6' L & S., Q.C.G., T.A., M.D.
13"x48" P & W Model B, Grd. Hd., Q.C.G., T.A., M.D.
12"x6' L & S, Q.C.G., D.B.G., M.D.

TURRET LATHES

PRACT. NEW No. 4F "FASTERMATIC" Chucking Machine, 35½" sw., M.D.
PRACT. NEW No. 4A W & S UNIV., Grd. Hd., 8¼" Hole, M.D.
No. 2A WARNER & SWASEY, Grd. Hd., M.D.
No. 3L GISHOLT, A.C. Motor
No. 2L GISHOLT, Saddle type, A.C. Motor (2)
26" LIBBY UNIVERSAL 7½" hole, M.D.

SCREW MACHINES

3¼" SINGLE SPINDLE GRIDLEY, M.D.
1—⅝"x7" 6 SPINDLE NEW BRITAIN M.D.
9/16" Model C NAT'L ACME Automatic
⅞" 4-SPINDLE NEW BRITAIN, Threading spdle.
3" CLEVELAND Model A, Square pan, pump
PRACT. NEW 1—⅜" MODEL AA CLEVELANDS, Sgle. Spdle., M.D. (2)
No. 2 and No. 2G B&S Turret Formers
No. 0 AUTOMATIC

MILLING MACHINES

PLAIN

PRACT. NEW No. 2MH CINC., motor in base, Grd. Hd., 10x52" table
PRACT. NEW No. 2 VAN NORMAN, motor in base, coolant pump, Timken brg.
No. 2 VAN NORMAN Duplex, 11x24" tble.
KEARNEY & TRECKER Double Overarm, Nos. 3B, 3, 2B, 2, 1½B.
No. 1½A K & T Horiz., s'gle overarm, M.D.
No. 4 CINC. HIGH POWER, Rap. Trav.
No. 1A KEARNEY & TRECKER, S.P.D. (15)
No. 4 LEBLOND HVY. DUTY, 16x68" Table, M.D., less Mtr., Grd. Hd.
No. 4 KEMP., B.G., 8x36" table, Gooseneck Overarm
No. 3 KEMP., D.B.G., 12x54" table
No. 3H LEBLOND HVY. DUTY, D.B.G., 16x53" table
No. 2-M CINC., Rect. Overarm, Grd. Hd., motor driven
No. 2½ ROCKFORD, 11x56" table, all geared, power feed
No. 2 CINC., Rap. Trav., Rect. over., 13x52" table, Grd. Head
No. 2 HENDEY NORTON, B.G., 10½x39¼" table, M.D., P.F.

UNIVERSAL

No. 2A BROWN & SHARPE, Mtr. in Base, P.F., 11x45" table, Grd. Hd. (2)

VERTICAL

PRACT. NEW No. 9J GORTON, 10½x35" table, M.D.
PRACT. NEW No. 2 CINC., Adj. Hd.; A.C. Motor in Base, 12x52" table
PRACT. NEW No. 2K K & T, Motor in Base, Adj. Grd. Hd., Dial Type
No. 4 CINC., Grd. Hd., Rap. Trav., 16½x64" table, M.D., P.F.
No. 4 PRATT & WHITNEY, 18x72" table, Power Feeds to Table
No. 10 JACKSON, 18x72" table, Gear Box Motor Drive
No. 2½B KEARNEY & TRECKER, A.C., M.D.
No. 1 B & S, 12x37½" table

PRODUCTION

48" CINC. DUPLEX, 19x64" table, M.D.
PRACT. NEW 18" CINC. PLAIN MFG., NEW 1941
PRACT. NEW No. 36 DE VLIEG, 15x66" table, B.G., motor in base
No. 3 SUNDSTRAND RIGID MILL, 50"x14½" table, P.F., Rect. Overarm
No. 45 PRODUCTOMATIC, Rotary tble., AC Motor in Base
10" PRATT & WHITNEY SEMI-AUTO., 6⅝"x18" table, M.D.

PLANER TYPE AND SLAB

72"x54"x15' INGERSOLL ADJ. RAIL PLANER TYPE, one rail head, one side head, A.C., M.D.
42"x42"x13' INGERSOLL SLAB, one vert. head, M.D., No. 5 M.T.

THREAD

PRACT. NEW 4"x9" HANSON WHITNEY, 33" bed, 9" betw., M.D. (3)
No. 3 LEES BRADNER, Belt drive

HORIZONTAL BORING

No. 33 LUCAS, table type, 4½" bar, M.D., Outboard support
8" Bar NILES BEMENT POND, Length of Bed 25', Height of Col. 19½', M.D.
No. 9-U-3 NATCO 3-way Hydr. Drilling & Bor., New 1942, 1¾" Hole, each hd. ind. driven
FOX HORIZ. HYDR. Boring & Drilling Machine, New in 1941
4" KEMP., Floor type, 42x60" table, No. 5 M.T., M.D.
3¾" BARRETT, Floor type, No. 6 M.T., Motor Dr. less Mtr.
3" PUTNAM, P.F., 30½"x82" Base, M.D.
FOOTE-BURT 2-WAY DRILLING AND BORING, P.F., M.D., less Mtr.

VERTICAL BORING

PRACT. NEW 36" BULLARD VERT. TURRET LATHE, M.D.
100" NILES BEMENT POND, Rapid Traverse, 2 heads on rail, M.D.

FOX VERT. Hydr. Boring & Drilling Machines, New in 1940
51" BULLARD, 2 Swiv. Hds. on Rail, B.G.
42" KING, Grd. feeds, 2 heads on rail, M.D. less motor
42" CINC., Rap. Trav., Gear Box Drive, 2 Swivel Hds. on Rail
42" GISHOLT, 2 swivel heads, motor driven
30" KING, 28" Table, Rap. Trav.
24" BULLARD RAPID PROD., side head, 4 Jaw Chuck, M.D., Rapid Trav.

GRINDERS

CYL.—INTERNAL

PRACT. NEW No. 39 EXCELLO Internal Thread, M.D.
No. 72 HEALD SIZEMATIC, Hyd. feed, M.D.
No. 11 B & S Cyl., Sgl. pulley drive thru gear box
No. 5 Bryant Internal, M.D.

SURFACE

PRACT. NEW 12"x48" MATTISON Hydr., mag. chuck, A.C. motor
No. 3 ABRASIVE, 6x22" table
No. 78 WILMARTH & MORMAN, 6x18 cap.
8" HEALD ROTARY, Mag. chuck
PRACT. NEW 6x18" NORTON HYDR., B & S Mag. chuck, M.D.
No. 2 C REID, 6x18" cap., Excello Spdle., B & S mag. chuck
No. 2 BROWN & SHARPE, 6x18", mag. chuck

TOOL & CUTTER

PRACT. NEW No. 2 NORTON UNIV.
No. R-6 PRATT & WHITNEY, 6-7/16"x 8½" table

PLANERS

96"x18' BEMENT NILES, 2 rail and 2 side heads, M.D.
60"x54"x14' WOODWARD & POWELL, 2 rail and 2 side heads
48"x40"x17' CINCI. WIDENED PATTERN 2 swivel heads on rail, M.D., P.F.
48"x48"x10' GRAY, 2 rail heads, M.D.
CINCI. OPENSIDE SHAPER PLANER, 36" max. str., one swivel head, M.D.

SHAPERS

PRACT. NEW 32" OHIO, M.D.
PRACT. NEW 28" ROCKFORD HORIZ. Hyd.
24" CINCI. Hvy. Duty Horiz.
24" AMER. 16"x22" table, M.D.
16" GOULD & EBERHARDT
10" P & W VERTICAL, 24" dia. rotary table.
FACTORY REB. MORTON DRAWCUT, 19' 8" travel, 72" stroke

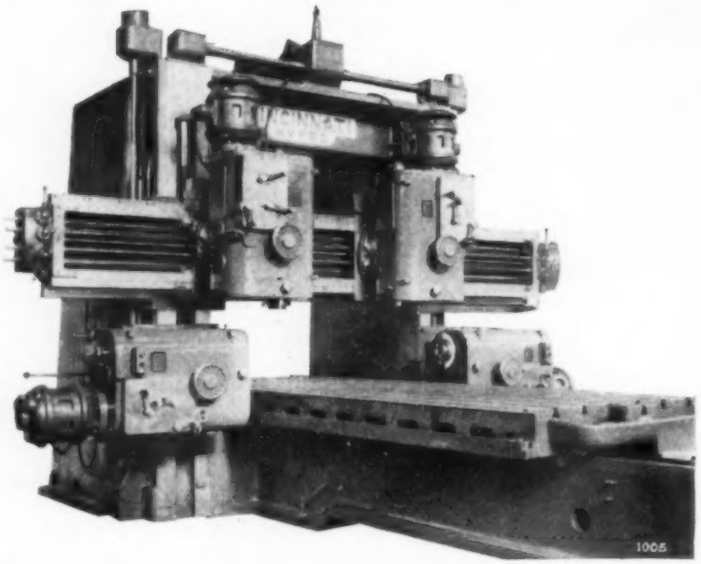
THESE ARE BUT A FEW OF THE MANY MACHINES WE HAVE IN STOCK. SEND FOR FREE COPY OF OUR "MACHINERY MART". WE ARE AUTHORIZED BY WAR ASSETS ADMINISTRATION TO SELL GOVERNMENT SURPLUS MACHINERY

MDNA MEMBER

INTERSTATE Machinery Co., Inc.
1439 W. PERSHING RD., CHICAGO 9, ILL.

BEAUTIFUL CONDITION

72" x 46" x 14' CINCINNATI HYPRO PLANER TYPE MILLING MACHINE



Two Heads on Cross Rail and Two Side Heads, 7½" Quills, All Heads arranged for Swivelling, including Cutting Lubricants. Motor Driven with 10 H.P. Motors on Heads, 7½ H.P. Drive Motor, 5 H.P. Rail Motor and ½ H.P. Pump Motor. All Motors and Controls for A.C. Current.

NEW IN 1941

IMMEDIATE DELIVERY — WIRE TODAY

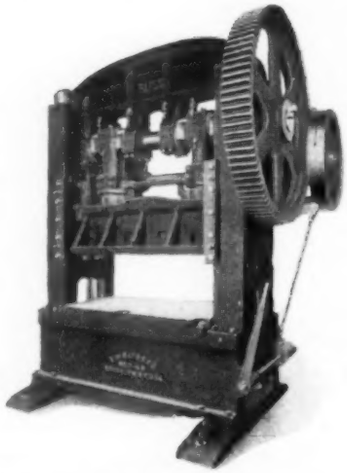
J. L. LUCAS & SON, Inc., Bridgeport 5, Conn.

WORLD'S LARGEST STOCK

STAMPING PRESSES

REBUILT *and* GUARANTEED

BLISS
CLEARING
CLEVELAND
CONSOLIDATED
L & J
MINSTER
NIAGARA
TOLEDO
V & O
WATERBURY-FARREL



OPEN BACK INCLINABLE
STRAIGHT SIDE
(Single-Double Crank)
HORNING
KNUCKLE JOINT
STILES TYPE
TOGGLE DRAWING
CAM DRAWING

also

SQUARING SHEARS
PRESS BRAKES

JOSEPH HYMAN & SONS

TIOGA, LIVINGSTON & ALMOND STS.

PHILADELPHIA 34, PENNA. ***Phone* REGENT 9-7727**

QUALITY *Machine Tools*

NOW IN STOCK

AUTOMATICS

5¼" Cleveland Model A, single spindle.
16" x 33" Fay Automatic Lathe.
⅞" Cleveland Model M, four spindle.

BORING MILL

No. 31 Lucas, motor driven.

DRILLS

★ **4 Ft. American Hole Wizard Radial Drill, motor on arm, new in 1940.**
No. 1½ Colburn, single spindle.
No. 3¼ Baker, single spindle.
★ **21" and 28" Cincinnati-Bickford Super Service Drill.**
42" Cincinnati Bickford.
Allen Sensitive Drill, four spindle.
★ **No. 3 Bausch Multiple, 20 Spindle, No. 2 Morse Taper, Rectang. Head 20" x 40".**

GEAR CUTTERS

Model A and D Barber-Colman Gear Hobbers.
No. 3 and No. 12 Barber-Coleman Gear Hobbers.
No. 61 Fellows Gear Shaper, m.d.
6" Gleason Str. Bevel Gear Generator.

GRINDERS

36" x 168" Mattison Surface Grinder.
No. 22 Heald Rotary Surface Grinder.
No. 16-26" Blanchard Surface Grinder.
No. 72A3 Heald Sizematic Int. Grinder.
No. 72A3 Heald Gagematic Int. Grinder.
No. 13 Brown & Sharpe Universal & Tool.
10" x 24" Norton Cylindrical Grinder.
★ **14" x 36" Landis Type C Hydraulic Universal Grinder, motor driven.**
No. 2 & No. 3 Cinci. Centerless Grinder.
No. 35 Excello Thd. Grndr., new in 1943.
No. 5VRO Hammond Buffer.

LATHES, ENGINE

14" x 6' Sebastian, motor in base.
16"x6' Hendey, g.h.
20" x 12' Lodge & Shipley, g.h.
48" x 12' Lodge & Shipley, C.D.
IMP and LR Lo-Swing, m.d., new in 1940.
15" x 30" Lipe Carbo-matic, new in 1943.

LATHES, TURRET

No. 3A Warner & Swasey, g.h.
No. 2A Warner & Swasey, Timken Bearing, new 1942.
No. 1A Warner & Swasey, g.h., new 1943.
No. 1B Foster, g.h.
No. 4 Warner & Swasey, g.h., new in 1942.
No. 5 Warner & Swasey, Universal, g.h., New in 1943.
No. 3 Warner & Swasey, g.h., new in 1943.
No. 1 Bardons & Oliver, c.d.
No. 1 Brown & Sharpe, m.d.
No. 6D Potter & Johnston.

MILLS

No. 31 Lucas Horizontal Bor'g Mill, m.d.
No. 36 VanNorman, Ram Type, m.d.
No. 4A Brown & Sharpe Universal, s.p.d.
No. 3 Cincinnati Universal, s.p.d.
No. 4 Cin. Plain, Rect. Overarm.
No. 2H Milwaukee Plain double overarm, motor in base.
No. 2-MH Cincinnati Plain, m.d.
★ **No. 4H Milwaukee, Double Overarm, motor in base, new 1940.**
No. 2H Milwaukee Vert., motor in base.
No. 2209 Milwaukee, Table 22" x 158".
No. 3-36 Cinci. Hydromatic Duplex, m.d.
No. 6 Whitney Hand Mill.

MISCELLANEOUS

No. 17 Greenerd Arbor Press.
No. 100 Micromatic Hydrohoner.
8" x 7" Troy Vertical Steam Engine.

PLANERS AND SHAPERS

16" Gould & Eberht. Crank Shaper, m.d.
★ **6" Pratt & Whitney Vertical Shaper.**
36" x 36" x 12' Liberty Planer, 2 heads, box table.
42" x 42" x 20' Cin. Planer, D.C. Rev. m.d.

TAPPERS

No. 2BG Garvin.
Leland-Gifford Radial.

No. 2 Cincinnati Centerless Grinder, with Filmatic bearing, hydraulic profile truing attachment, through feed work rest, motor driven. New in 1942.

12' x 3/16" Bertsch Combination Punch and Shear, with 15" gap, double geared, motor driven.

(Approved Dealer for War Assets Administration Surplus Machines)

INDIANAPOLIS
MACHINERY & SUPPLY CO., INC.

1961 S. Meridian St., Indianapolis 6, Indiana

EASTERN BRANCH: 44 WHITEHALL ST., NEW YORK
MEXICO OFFICE: *Avenida Independencia No. 36B, MEXICO, D. F.*

WHEN WORK WON'T WAIT.....

WIRE WIGGLESWORTH OF CAMBRIDGE, MASS.

LATE MODELS OF MACHINE TOOLS FOR EARLY DELIVERY

BORING MILLS

3" UNIVERSAL HORIZONTAL, M.D. (1942)
No. 340-F G & L Floor Type 60" headstock and column travel, (1943)
36" KING Vert. Turret Lathe, (1942)

GRINDERS

No. 72-A3 HEALD Pl. Int., M.D. (1942)
4"x12" LANDIS Type H Plain Cyl., M.D., Practically New.
14"x168" NORTON Type C Cyl., M.D. (1942)
No. 4T SELLERS Tool Grinder, M.D. New —Used only few hours.
No. 11 BLANCHARD ROTARY SURFACE, M.D., 16" & 20" chucks (1942)

LATHES

22"x96" Centers MONARCH "M", M.D. (1944)
42"x132" Centers AMERICAN "SUPER PRODUCTIVE", M.D. (1942)
50"x17' Centers LeBLOND "BIG SWING", M.D. (1942)

MILLING MACHINES

No. 1H-12 K & T MFG. MILLER (1941)
No. 4MS CINCINNATI PL. MILLER (1942)
No. 5H K & T Pl. MILLER, M.D. (1942)

RADIAL DRILLS

3'-11" AMERICAN "HOLE WIZARD", M.D. (1941)
3'-11" MORRIS "MOR-SPEED", M.D. (1941)
4'-13" CINCINNATI-BICKFORD RADIAL, S.P.D. through Gear Box.

TURRET LATHES

No. O B & S WIRE FEED SCREW MACHINES, M.D. (1941), (3)
No. 4 W & S UNIV. TURRET LATHES, M.D., chucking, Pre-Selective Head, (5)
No. 5 W & S UNIV. TURRET LATHE, M.D., chucking, Pre-Selective Head.
No. 5 J & L TURRET LATHE, M.D. (1942)
No. 1A W & S UNIV. TURRET LATHES, M.D. (1941), (3)

MISCELLANEOUS

24" CINC. BICKFORD BOX COLUMN UPRIGHT, M.D. (1943)
No. 4½ BLISS SS 3-CRANK D.A. PRESS, M.D.
New HUB 15 ton OBI PRESS, M.D.
New U.S. OBI PRESS, 12 ton, M.D.

••• WIGGLESWORTH MACHINERY CO. •••

203 BENT STREET • CAMBRIDGE, MASS.

Rare Values

BORING MILLS

Horiz. 2½" bar, Cleveland, M.D.
Horiz. 3" bar, Universal Triway.
Horiz. 3⅛" bar, No. 0 G & L.
Horiz. Floor Type 3½" Landis.
Horiz. 5"x20' Barrett, No. 2
Horiz. No. 44 Univ. 4½" bar, Triway.
Horiz. Fl. Type, No. 35 Landis, 3½" bar.
36" Bullard "New Era" M.D.
36"-44" N-B-P, Tur. & Side Hds.
42" King, Side Head, M.D.
60" N-B-P, 2 Hds., M.D.

DRILLS

3-Spdl. Avey, No. 2 M.T.
3-Spdl. 20" Barnes, M.D.
6-Spdl. Moline, No. 7-D.
Drills, Radial, 3' Cincinnati-Bickford, M.D.
Radial, 5' Western T.A., M.D.
Radial, 6' Cin.-Bickford, M.D.
20" Barnes, Camelback.
26" Colburn, No. 5 M.T., S.P.D.
42" Barnes, sliding head.
No. 513 Baker, No. 6 M.T.

GEAR CUTTERS

Planer, bevel, 54" Gleason.
Spur, 40", Gould & Eberhardt.
104"x22" Gould & Eberhardt.

GRINDERS

Centerless, No. 2 Cincti., M.D.
Cyl. Plain, No. 11 B&S, 6"x32".
Cyl. Plain, 14"x72" Norton, M.D.
Disc, No. 14—30" Besly, S.P.D.
Drill, Oliver Twist, 1½", M.D.
Internal, Heald, No. 70, M.D.
Internal, Heald, No. 72A5, M.D.
Knife, 120" Springfield, M.D.
Surf. Rot. No. 25 Heald, chk. 16" dia.
Surf. vert., No. 16 Blanchard.
Surf., vert., 48"x18" P & W.
Surf., vert., 40"x12" P & W.
Univ., No. 2 B & S, 14"x36".

LATHES ENGINE

4"x60" Lo-Swing, G.H., M.D.
18"x6' Greaves-Klusman, Q.C.G.
14"x6' Hendey, Q.C.G., T.A.
26"x12' Sch. & Boye, Q.C.G.
27"x16' Boye & Emmes, G.H. (1942).
Lathes, Engine, 27"x18' Niles "Time Saver," G.H.
30"x14' Boyes & Emmes, Q.C.G.
36"x22' N-B-P, Grd. Hd., Q.C.G.
38"x19' Putnam, Grd. Hd.

LATHES TURRET

16" American Brass.
18" Libby, 3⅜" H.S.
2A W & S, Univ., 2½" H.S.
3A W & S, Univ., 4¾" H.S.
No. 4 W & S, Univ., 1 27/32".
No. 6W Acme, Univ. 3".

MILLING MACHINES

Duplex, 24" Cinc., Auto., M.D.
Keyway, No. 7 Burr, tbl 12½x96".
Plain, No. 1H Bickett, B.D.
Plain, No. 1½B K & T, M.D.
Milling Mches., Plain, No. 3B B&S, rack cut. att.
Plain, No. 3-S Cinc., S.P.D.
Plain, No. 4 Cincinnati, B.D.
Plain, No. 4B, Brown & Sharpe.
Plain, No. 5 Cincinnati, M.D.
Planer Type, 30x36x12" Ingersoll.
Milling Mches., Univ., No. 1 Cinti., M.D.
Vert., No. 1 & 2 Knight, M.D.
Vert., No. 2A Milwaukee, M.D.
Vert., No. 3 & 4 Cincinnati.

MISCELLANEOUS

Air Comp. Ing.-Rand Vert. 445 c.f.
Bolt Threaders (2) Dbl. Hd., 2" Murchey (New 1945).
Boring Bars, 4½"x10', 5"x12'.
Broach, Hyd., XA Oilgear, 60" stroke.
Broach, Vert., LaPointe, Type SRV5-42".
Hammer, 1,000 lb. B & S, Board Drop.
Hoist, 1 ton Shepard, 110 V, D.C.
Honing Mch., No. 1 Micromatic.
Planer, 10"x10'x26' Pond, 4 hds., m.d.
Press, No. 355 Toledo Reducing.
Profiler, No. 13 P & W, M.D.
Pumps, Triplex, Worth. gpm. 102.
Rivet Spinner, SP-75 Airflex, 5/32".
Saw, Hack, 6"x6" Peerless, s.p.d.
Saw, Hot, 54" United, Sli. Fr.
Saw Sharpener, No. 11 Covel 8"-12".
Shaper, Vert., 10" P & W.
Shaper, 16" Milwaukee, m.d.
Shear, Alligator, No. 1 Canton, cap. 1½".
Shear, O.E. Bar, United, 2½" sq.
Tapper, No. 2X Garvin, B.D.
Tapper, ½" Rickert-Shafer.

MULT-AU-MATICS

4—6 Spindle Bullard, Type A, Mult-Au-Matics, cap. 12" dia., 7¼" in Hgt., 4¼" in Hgt., 6-3-jaw Univ. 14" dia. chucks, 15 H.P. West. AC Motors, very good condition.

LANG Machinery Company

28th St. and A. V. R. R. Phone Grant 3595 Pittsburgh 22, Pa.

PRODUCING GOODS FOR PROFIT

MACHINERY DEALERS
MDNA
MEMBER
NATIONAL ASSOCIATION

Competitive production of goods for a profit requires the manufacturer to use the best machine tools his budget can afford.

Your machine tool and equipment men will find the *experience, judgment,* and *services* of the Machinery Dealers' National Association's members valuable to your firm in selection and disposal of machine tools. These established dealers have been helping manufacturers produce goods at a profit for years.

The list of members located in 23 states and 48 cities is available to manufacturers. Write today for your list.

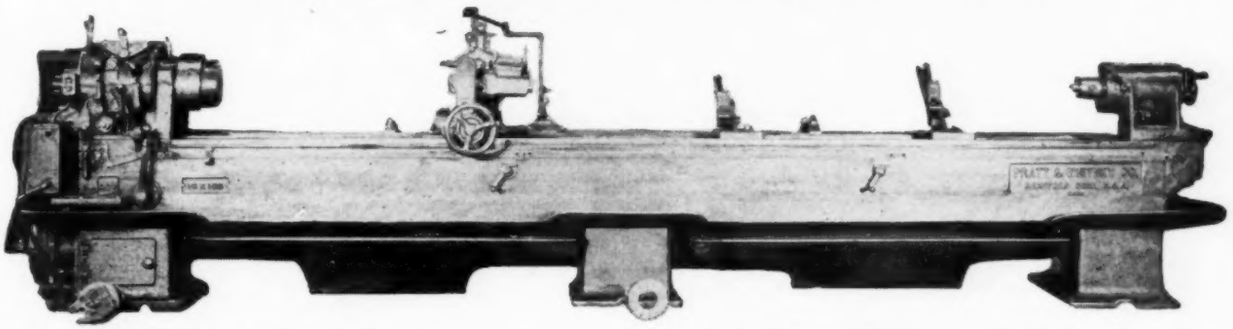
MACHINERY DEALERS NATIONAL ASSOCIATION

20 NORTH WACKER DRIVE CHICAGO 6, ILLINOIS

R. K. VINSON, *Executive Director*

10" x 168" Pratt & Whitney THREAD MILL

IMMEDIATE DELIVERY — EXCELLENT CONDITION



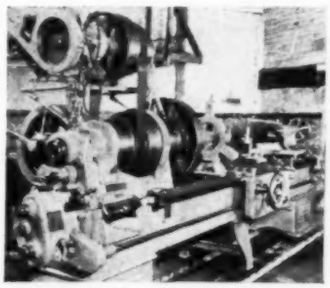
Length that can be cut between centers 168"
Dia. external thread that can be milled 10"
Lead that can be cut with regular gears: minimum, threads per inch 12; maximum, lead 48"
Depth that can be cut 1-9/16"
Collet capacity 3½"
Follow rest capacity 3½"
Index ring, regular, number of notches 12
Lead screw, threads per inch 2
Speeds: work spindle speed changes (by slip gears) 17; spindle speed, min. r.p.m. 0.08; spindle speed, max. r.p.m. 1.27; cutter spindle speeds (5) 44 to 144 r.p.m. with miscellaneous collets and equipment. Arr. for motor drive with 3 H.P. A.C. motor

Wire — Write — Phone

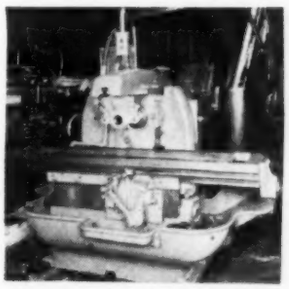
EMERMAN MACHINERY CORP.

875 W. 120th STREET **CHICAGO 43, ILLINOIS**

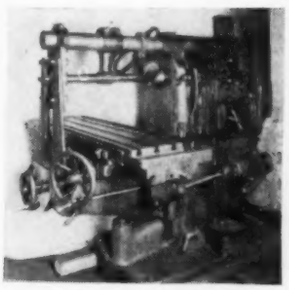
AT REDUCED PRICES



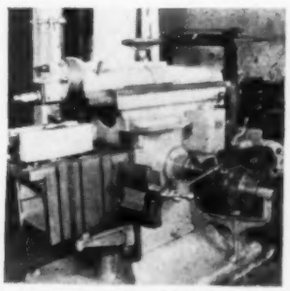
American Q. C. Lathe, 24"x90" C.C., motor & Drive. $1500.00.



DeVlieg model 31 Super Mill, motor, $800.00.

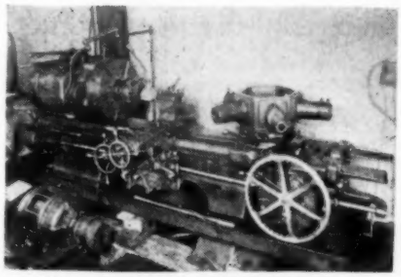


Brown & Sharpe #4B Plain Miller, less motor, $1200.00



Niles 26" Crank Shaper, B.G. Motor and Drive, $1200.00.

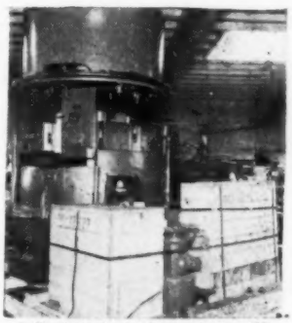
ALSO IN STOCK



Warner Swasey 3A Universal Lathe serial 320000, $1400.00.

3—Acme Gridley RA 6 spindle, 1¼" Bar Machines, new 1942, $5950 ea.
Wickes geared head Engine Lathe, 30" swing x 34' overall, $2500.
2—#3 Barber Colman Precision Gear Hobbers.
Cincinnati #4 Plain Miller rectangular overarm, $1800.
K & T Simplex Miller, new 1942, $1750.
King 42" Vertical Boring Mill, $1100.
Cincinnati #2 Vertical, all geared Miller, $1000.
Racine hydraulic Cut-Off Saw, 12"—1942, $1250.
2—W & S #3 Universal Turret Lathes with bar attachment complete, 1942, $2400 ea.
W & S #4 Universal Turret Lathe, preselector head, 1941, $2300.

Many Other Good Machines including 2 Late Sand Blast Units



Bullard Multaumatic 6 spindle, 12" $3500.00

GENERAL MACHINERY AND EQUIPMENT CO.

Warehouses in Harrisburg, Lancaster and Philadelphia, Pa.

180 S. 15th STREET HARRISBURG, PA.

HIGH GRADE TOOLS *for* EVERY TYPE OF JOB

LATHES

14" x 6' American 4 S.C.D. Taper Q.C.
16" x 6' American 8-speed Grd. Hd., arr. M.D.
18" x 6' American 8-speed Grd. Hd., arr. M.D.
24" x 10' Lodge & Shipley, 3 S.C.D., Q.C., taper
24" x 12' Boye & Emmes 3 S.C.D., D.B.G. Q.C.
25" x 10' LeBlond Grd. Hd. A.C. M.D. Taper attachment
25" x 28' LeBlond Grd. Hd., taper, SPD
36" x 32" American Grd. Hd., 2 carriages, tapers, AC MD
36" x 18' Putnam Grd. Hd. A.C. M.D. Q.C.
36" x 24' Putnam Grd. Hd. A.C. M.D. Q.C.

PLANERS

48" x 48" x 10' Cincinnati Planer, 2 Heads, B.D.
60" x 60" x 36' Cincinnati, 4 heads
84" x 84" x 20' Cincinnati Heavy, 4 heads. D.C. drive. Box table

RADIAL DRILLS

4' Carlton H.D. Radial Drills A.C. M.D.
5'-13" Column Fosdick Plain Radial Drill, S.P.D.
6' American Enclosed Head, D.C. Drive
6' Cincinnati Bickford, M.D.
7' Cincinnati Bickford, M.D.
7' Amercan Triple Purpose, M.D.

GEAR MACHINERY

60-H Gould & Eberhardt Gear Hobbing, M.D.
No. 12 Barber-Colman Hobbers, Double Overarm

GRINDERS

Taft Pierce No. 1 Surface, M.D.
No. 16-30" Blanchard H.P. Vertical, M.D.
Pratt & Whitney 10" 2-wheel Gear Grinders, AC MD
10" x 24" Type BA Norton Cylindrical, AC MD
14" x 96" Norton Cylindrical, B.D.

MILLING MACHINES

No. 1B Milwaukee Plain A.C. M.D.
No. 1½B Milwaukee Universal, D.O.A. M.D.
No. 2B and 3B Milwaukee Plain Double overarm
No. 3-K Milwaukee Vertical
No. 4 Cincinnati H. S. Vertical
No. 4 Cincinnati H.P. Rect. O.A. PRT. S.P.D.
No. 2 Cincinnati Plain, S.P.D.
No. 45-60" Cincinnati Hydromatic Duplex, M.D.
No. 5 Cincinnati H.P. Plain, S.P.D.
No. 36-V Van Norman Ram Type Vert., slid. hd., AC MD, new in 1942
No. M-118 Van Norman Plain AC MD, new in 1942
No. 2—24" Sundstrand ElectroMills, AC MD
12"x24" Lees-Bradner Thread, AC MD
36" Ohio Production

BORING MILLS

24", 36", 42", 54" Bullard "New Eras"
42" Bullard 2 Heads
61" Bullard MaxiMill, 2 Heads, PRT. A.C. M.D.
72" N-B-P, 2 Heads

MISCELLANEOUS

14" Niles Slotter, Cone
2¼"x24" J. & L. Turret Lathes
7—No. 2 Simmons Turret Lathes, bar feed, AC MD
No. 4A Warner & Swasey Univ. Turret Lathes, 9" and 12" hollow spindles, AC MD

CINCINNATI MACHINERY CO., INC.
217 EAST SECOND STREET
CINCINNATI 2, OHIO

Representing
★ BUFFALO FORGE COMPANY Drilling Machines
HILL-CLARKE MACHINERY CO. Cylindrical Grinders
★ JOHNSON MACHINE & PRESS Inclinable Presses
★ FAMCO MACHINE CO. Arbor & Kick Presses
★ CINCINNATI ELECTRICAL TOOL CO. Grinders & Buffers
★ WIGGLESWORTH MACHINE TOOL CO. Milling Machines
★ U. S. MACHINE TOOL CO. Hand Millers
BURKE MACHINE TOOL CO. Hand Millers
RASMUSSEN MACHINE CO. Hack Saws
★ LINCOLN MACHINE SPECIALTY CO. Eklind Milling Heads
★ MANNING, MAXWELL & MOORE Budgit Hoists
★ DRIVE-ALL MFG. CO. Machine Tool Drives
★ ALFRED A. TROYKE Rotary Tables
★ AMES SPOT WELDER Welders
★ YOST CO. Vises
★ K. O. LEE CO. Tool Cutter & Grinders
★ CARRIED IN STOCK
1721 SUPERIOR AVE. CLEVELAND OHIO

Late-type MACHINE TOOLS *by the hundreds!*

MILLERS

No. 2, 3, 4 Cincinnati High Speed dial type horizontal and vertical
Cincinnati Plain & Duplex Hydromatic
Cincinnati Horzontal and Vertcal Hydrotel

LATHES

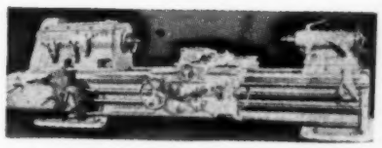
22" x 48" Monarch Tool Room Lathe
27" x 96" Monarch Tool Room Lathe
16" x 60" Reed Prentiss with Duplicator
5" x 10" Seneca Falls Model LR LoSwing with air chuck

TURRET LATHES

4A Warner & Swasey with chuck & Th att.
No. 3 W. & S. Universal turret, bar
No. 4 W. & S. Universal turret, bar
No. 3, 4, 5, Gisholt Turrets with bar

PRESSES

7, 14, and 28 Ton Diamond Punch Presses
5 and 10 Ton Rouselle Presses
500 Ton Hydraulic Forming Press 24" stroke



22"x48" and 96" MONARCH LATHE

MISCELLANEOUS

340-F Giddings & Lewis Boring Mill, 4" bar
2 spindle Avey Drill Press, Aveymatic Feed
4 sp. 2LMS 14" Leland Gifford, power feeds
No. 2 Cincinnati Centerless Grinder
No. 2 Cincinnati Tool & Cutter Grinder
12 x 48" Norton HYD Universal Grinder

T. R. WIGGLESWORTH MACHINERY CO.

1721 SUPERIOR AVENUE
CLEVELAND OHIO

CONSIDER THESE VALUES

For Better Performance

10" x 36" Norton Plain Hyd. Grinder, 1941.
Ex-Cell-O Int. Grinder for small bores.
2⅝" 8-Spindle Conomatic, 1941.
#11 Polymatic Form & Cut-off 5/16" capacity. Excellent condition.
Ames Precision Univ. Bench Mill, new.
6" x 18" Landis Plain Hyd. Grinder, "C".
#1B Kearney & Trecker Univ. Mill, Dividing Head, Vise, Motorized.
DDG 54 Ferracute DA Drawing Press.
#4 Gisholt Univ. Turret Lathe, Hyd. Speed Selector, 1941.

These and other useful items REASONABLY PRICED and ready for IMMEDIATE DELIVERY AT

OTT MACHINERY SALES, INC.
546 Second Ave., Detroit 26, Mich.
CAdillac 3103

PRICED FOR QUICK SALE

36"x25' Bridgefort GH Engine Lathe, MD.
17"x10' Sidney, QCHG. Engine Lathe, MD.
No. 112 Rivett, I.D. Grinder, MD. 1943
6"x30" Norton O.D. Grinder, MD. 1943
No. M-3 Abrasive Surface Grinder, MD.
No. 42 Van Norman Oscill. Radius Grinder, MD
No. 2-B B & S Plain, Heavy Duty Mill, MD
Becker Model C Vertical Miller, MD.
No. 422 Baker Drill Press Head, #4 M.T. MD. new.
26" Cincinnati Drill Press, #4 M. T. MD.
MANY MORE—INQUIRIES INVITED

SURPLUS MATERIAL & MACHINERY CO.
8735 Kercheval, Detroit 14
Phones LE 3876 & 6843

IN STOCK

No. 45 GIDDINGS & LEWIS Table Type Horizontal Boring Mill 5" diam. spindle

24"x10' AMERICAN Geared Head Engine Lathe

5'-15" col. CINCINNATI BICKFORD Super Service Radial Drill

24" GOULD & EBERHARDT High Duty Crank Shaper

No. 4 CINCINNATI Hi-Power Plain Horizontal Miller

No. 55 GALLMEYER & LIVINGSTON Hydraulic Surface Grinder

No. 1A WARNER & SWASEY Preselector Head Turret Lathe

No. 4 WARNER & SWASEY Preselector Head Universal Turret Lathe

O'CONNELL MACHINERY COMPANY

1825 Niagara St. Buffalo 7, N. Y.
DElaware 3400

Make BOTWINIK NEW HAVEN Your Machinery Headquarters

Modern Machine Tools Ready to Ship Immense Stock.....

DRILLS

Avey & Allen 3, 4, 5, & 6 Sp.
Cincinnati-Bickford 3', 4', 5', & 6' Radials

GRINDERS

Brown & Sharpe No. 2 Surface Motor-in-Base
B. & S. Nos. 1, 2, & 3 Univ.
B. & S. No. 13 Univ. & Tool
Abrasive Nos. 33 & 34; No. 3B
Gardner & Besly 53" Horizontal Disc
Norton 6"x18" Hyd. Surface
Norton 6"x10"x36" Surface
Norton 15"x15"x72" Surface
Norton 6x32, 10x24, 10x50 Plain
B. & S. Nos. 10, 11, Plain
Bryant Nos. 3B, 5, 6, 12 Internal
Heald No. 70-A, Internal
Landis 12"x32"
Cincinnati No. 1½ Tool & Cutter
LeBlond No. 2 Tool & Cutter
Norton No. 2 Tool & Cutter
Cincinnati No. 2 & No. 3 Centerless
Cincinnati No. 3 Centerless Lapper
Fitchburg 36" Spline Grinder
Blanchard No. 16—30"
Blanchard No. 18 Rotary Surface
Heald No. 25—A Rotary Surface
P. & W. 14" Vert. B.B.
Barber Colman No. 3 Hobber & Grinder

LATHES

Hendey 14"x6' Y.H.
American 16"x6'—G.H.
Lodge & Shipley 20"x8', G.H.
LeBlond 20"x8' Q.C.G. Heavy Duty

MILLERS

Brown & Sharpe No. 2 Lt. Type Plain
Milw. No. 2B & 3B Double Overarm
K. & T. No. 5H Plain
B. & S. No. OY Production
Cin. No. 2 Plain; Nos. 3, 4 Vert.
Becker Model C, Vertical
Becker No. 7H, Plain
B. & S. No. 3B & 5B Plain
Rice-Barton 4" Spline
P. & W. 8", 10" & 12" Automatic
Cincinnati 18" & 24" Production
Sundstrand No. 1-18 and No. 2 Electromil.
P. & W. 6x14 & 6x72 Thread
Lees-Bradner 6"x36" Thread
Van Norman Duplex Nos. 0-2-20
Van Norman #2 Plain
Cincinnati #5 M.D. Plain
K&T #2K Vertical

PLANERS

Cincinnati—48"x48"x20', 3 Head
Powell 48"x48"x12', 4 Head

SCREW MACHINES

B. & S. No. 00, 0, 2 Automatics
B. & S. No. 1 & 2 Hand Screw
Potter & Johnson No. 6-C Chuckers
Cleveland 1⅜" Model AA
W. & S. Nos. 1, 2, 2A, 3A Universal
Foster No. 7 and No. 1B
Cone 1¼" 4 Spindle
Cleveland 3¾" Model A, Latest Type
Cone 3½"—4 Spindle
Cleveland 6¾", Model A
Cleveland 7¾", Model A
Gridley ⅞", 1¼", 1¾" & 2⅝", Model G; 3¼" & 4¼"

MISCELLANEOUS

Boremetic—Heald No. 47-A
Boring Mill—Gisholt 30"
Boring Mill—Bullard 36" & 42" New Era
Boring Mill—Bullard 100" 2 Head.
Cutoff Machine—Abrasive No. 213 Fay Automatic
Fellows Gear Shaper No. 7
Hammers—Bradley
Rack Shaper—Fellows 4"x72"
Slotter P. & W. 6" Vert.
Trimming Mach.—V. & O. No. 202½
Turret Lathe—W. & S. No. 3 Late Type
Z&H #7 Percussion Press
Waterbury Farrel 125 Ton Hydraulic Press
Manville #5 4 Slide Wire Former (Under Cutoff Machine)
Dewalt #ME2 H. Sp. Abrasive
Tanniwitz Die Saw & Filer

373 WELTON ST., NEW HAVEN 9, CONN.
EXPORT DEP'T: 44 G WHITEHALL ST., NEW YORK

Botwinik Bros.
INCORPORATED

LATE TYPE MACHINES

AUTOMATICS, (2) Cleve. ⅞" cutoff (1943) ea. $ 975.00
AUTOMATICS, 2G Brown & Sharpe equipment (1943) 4975.00
DRILL, Stocker, Deep Hole (1943) 795.00
DRILLING & BORING MACHINE, Excello Horiz., M.D. (1943) 795.00
GRINDER, Marschke No. 24, 10 HP A.C. Semi 275.00
GRINDER, Kwikway Piston Type H (1943) 495.00
LATHE, 12x4 Sebastian, M.D. (1943) 995.00
LATHE, 12x4 Sidney (late) motor in base 795.00
LATHE, LeBlond, 20"x20" centers, M.D. (1943) 5500.00
LATHE, LeBlond, 22"x20' centers, M.D. (1943) 5500.00
LATHE, Niles 27x20, M.D. (1943) 5500.00
MILL, Vertical, 2H Milwaukee (1943) 1695.00
MILL, No. 5 Cinn. Rect. Overarm, M.D. (late) 1975.00
MILL, Cincinnati Hydromatic, No. 4-36 (1943) 2750.00
MILL, Van Norman 38P (1943) M.D. 3975.00

MISCELLANEOUS

AUTOMATIC, 1¼" Gridley, M.D., 4 sp. $ 575.00
AUTOMATIC, 2⅝" New Britain, 6 sp., M.D. 1275.00
AUTOMATIC, 3½" Acme, 4 sp., M.D. 1275.00
BORING MILL, Horiz., 2½" Universal, S.P.D. 1275.00
BROACH, No. 3 LaPointe 375.00
DRILL, 21" Barnes, geared feeds 145.00
DRILL, 24" Cincinnati (late) M.D., tap. att. 395.00
DRILL, Radial, 3' American, S.P.D. 695.00
DRILL, 1 sp., Edlund, M.D. 150.00
DRILL, 2 sp., Edlund, P.F., Mtr. each sp. 350.00
GEAR CUTTER, 3H Brown & Sharpe, M.D. 675.00
GRINDER, Tool & Cutter, No. 2 Wilmarth 225.00
GRINDER, Landis 6x20 395.00
LATHE, 10x4 Seneca Falls 225.00
LATHE, 14x6 Hendey, M.D. 795.00
LATHE, 14x6 Hamilton, Grd. Hd., T.A., M.D. 1150.00
LATHE, 16x8 Monarch, Q.C.G., M.D. 895.00
LATHE, 17x6 LeBlond, Q.C.G. 895.00
LATHE, 17x8 Sidney, Q.C.G. 875.00
LATHE, 18x10 American, M.D. 995.00
LATHE, 22"x24' bed LeBlond, Q.C.G. 1475.00
LATHE, 32x36" center LeBlond, short bed, M.D. 1175.00
LATHE, 36"x6' center, short bed, Houston M.D. $1475.00
LATHE, Hardinge, Bench 100.00
LATHE, Stub, Sundstrand 8" 395.00
MILL, Hand (6) Whitney #6, M.D. 145.00
MILL, Rigidmill, Sundstrand, M.D. (late) 775.00
MILLS, (2) Hendey Lincoln Type, M.D. ea. 195.00
MILL, No. 2 Kempsmith, Vert. Hd. 850.00
MILL, No. 2 Cincinnati, Vert. 495.00
MILL, No. 2 Cincinnati Universal 795.00
MILL, No. 1B Milwaukee Universal, S.P.D. 1175.00
MILL, No. 1½ Brown & Sharpe, Universal 775.00
NUT TAPPER, ACME, 4 sp., cap ⅝"-1" 375.00
PLANER, Niles 96"x96"x16', 4 Hds., M.D. 1995.00
POLISHING LATHE, (2) Gardner ea. 295.00
SHAPER, 14" Gould & Eberhardt, M.D. 875.00
SHAPER, 16" Gould & Eberhardt, S.P.D. 1075.00
SHEAR, Alligator, 18" blade, 30 HP motor 1075.00
THREAD MILL, 6x48 Pratt & Whitney, M.D. 475.00
TURRET LATHE, No. 4 Gisholt, Grd. Hd., M.D. 775.00
TURRET LATHE, 1B Foster, M.D. 675.00
TURRET LATHE, Warner & Swasey, 2A 575.00
TURRET LATHE, No. 7 Foster, chucker, Universal 475.00
TURRET LATHE, Foster No. 3, bar feed 350.00

PRESSES—SHEET METAL MACHINES

BRAKE 3' Dreis & Krump Power Apron, 10 ga. 495.00
BRAKE, 6' Niagara, Power Leaf 795.00
BRAKE, 8' Dreis & Krump Power Apron, 3/16" cap. 995.00
BRAKE, 12' D & K, Power Apron, M.D., 10 ga. (1944) 3250.00
PRESS, No. 93 Bliss, 2½" stroke, 40 ton 695.00
PRESS, No. 94 Consolidated, 2½" stroke, 40 ton 995.00
PRESS, 60 ton Styles type 995.00
PRESS, 80 ton Styles type 1475.00
PRESS, No. 54 Consolidated, 60 ton, 10" stroke 1275.00
PRESS, Bliss, Rack & Pinion, 50 ton 1295.00
PRESS, Hydraulic, 60 ton HPM, steam piston 995.00
WIRE STRAIGHTENER, Kane & Roach, M.D. 295.00
WIRE STRAIGHTENER, Climax #2, M.D. 375.00

WRITE FOR COMPLETE LIST!

MALCO MACHINERY COMPANY
739-45 W. VAN BUREN ST. CHICAGO 7, ILLINOIS

EXCELLENT BUYS FOR IMMEDIATE DELIVERY

6"x18" Thompson Hydr. Surf. Grinder—1943
10"x36" Norton Hydr. Surf. Grinder, vert. spdle—1943
22"x48" centers Model M Monarch Lathe, heavy duty, pan bed, tap. att.—1941
#5 W. & S. Ram Type Univ. Turret Lathe—1942
2½" Cleveland Horiz. Boring Bar, rot. table, motorized
3" Foote-Burt Horiz. Bor. Bar, SPD, table 26"x36"
36" Gisholt Vertical Boring Mill, M.D.
6' Cinc.-Bickford Radial Drill, SPD
7' American Triple Purpose Radial Drill, SPD
6"x18" Norton Hydr. Surf. Grinder
16"x72" Cincinnati Univ. Cyl. Grinder
16"x10' Hendey Geared Head Lathe complete
24"x16' Monarch QCG Lathe, tap. att., motorized
24"x20' Boye & Emmes QCG Lathe, tap. att., motorized
#2 Kempsmith Maximiller, plain, motor in base
#3A B. & S. Univ. Mill, SPD, motorized, complete
#4 Cincinnati Plain Mill, rectang. overarm, power rap. trav.
#4 Cincinnati Univ. Mill, hi-power
16" G. & E. V-Ram Shaper, motorized
21" Smith & Mills B.G. Shaper, motorized
#5 Gisholt Late Type Univ. Turret Lathe, Bar feed, collets, chuck, motorized

MANDEL-CAMRAS MACHINERY CO., INC.
809 W. Lake St. Chicago 7, Ill.

FOR SALE

I-BEAMS
Up to 15"
ANGLES
1" x 1" up to 8" x 8"
CHANNELS
All Sizes
T'S
All Sizes
REINFORCING BARS
⅜" to 1¼" Rd.

GLAZER STEEL CORP.
KNOXVILLE, TENN.
Tel. 4-8601

LATE TYPE RADIAL DRILLS

5' Cinci-Bickford, 17" col., 2-way base, '42
4' Carlton 11" col., '41
3' Cinci-Bickford, 11" col., 3-way base, '40
3' Amer., 11" col. Hole Wizard, '42.
4' Cinci Bick, 13" col., AC motors, '43.

BENNETT MACHINERY CO.
30 Church St. New York 7, N. Y.

5" AJAX UPSETTER, M. D.
AARON MACHINERY CO., INC.
45 Crosby Street New York, N. Y.

#4 Warner & Swasey univ. turret, Timken brgs.
#3 Gisholt univ. turret lathe, geared head
#2 Bardons & Oliver turret lathe, geared head
32" x 35' Wickes grd. hd. lathe, q.c., m.d.
#4 Cincinnati plain miller, rectangular overarm
#4 Brown & Sharpe plain miller, geared head
#2B Milwaukee milling machine, geared head
#1A Milwaukee milling machine, geared head
#1½B Milwaukee vertical miller, geared head
#2 Cincinnati vertical miller, High Power
#2 Brown & Sharpe automatic screw machine
6" x 48" Pratt & Whitney thread miller, m.d.
6" Pratt & Whitney vertical shaper, m.d.
#3 Barber Colman gear hobber, down feed
10" x 24" Landis univ. hydr. grinder
#5 Brown & Sharpe univ. tool cutter grinder.
#2 Brown & Sharpe surf. grinder, motor in base

MICKLEBURGH
117 North 4th Street
Philadelphia 6, Pa.
LOmbard 3-5044

PRESSES

Check with us on punch press requirements—several sizes and types now available.

PRESS & SHEAR EXCHANGE, Inc.
Office & Warehouse
3800 Maple Street, Dearborn, Mich.
Ce 9400

DEPEND on DELTA

McBride & McClennen

After 25 years in business we offer for the production and power needs of Manufacturers facing problems of re-equipping or reconversion our experience and our large stock of equipment.

MACHINE TOOLS

Lathes, Milling Machines, Grinders, Drill Presses, Shapers, Planers, Power Presses, Punches & Shears, Electric Welders (Spot & Arc).

POWER EQUIPMENT

Boilers, Engines (Steam and Diesel), Pumps, Air Compressors, Electric Motors & Generators, Transformers & ELECTRIC WELDERS.

DELTA
EQUIPMENT CO.

148 N. 3rd STREET PHILADELPHIA, PA.

Phone—Market 1860-61

Giddings & Lewis #360F horizontal boring mill, new in 1944.
Cincinnati Hypro Vertical Boring Mill 12 ft., new in 1941, 3 heads, all md.
Defiance horizontal boring mill #6, 4½" bar, md.
Lucas horizontal boring mill #31, 3" bar, md.
New Brown & Sharpe #3B plain milling machine.
Cincinnati #5 plain milling machine, spd.
Van Norman #21 Duplex milling machine, motor in base.
Smith & Mills 28" back geared shaper, arr. md.
Flather 24" md. back geared shaper.
American 4' "Hole Wizard" Radial Drill, 11" column.
Long & Alstatter 4" stroke bar and plate shear, 20" blade, double crank, will shear 3" bars.
Bement heavy duty steel plate shear, 14" blade, 34" throat.
Niagara #3 angle bending machine, new in 1941, md., will bend 1¾" x 1¾" x ¼".
Simonds pipe threader 1½" to 6" cap., md.
Farnham 15' pyramid type bending rolls, md., 19 gauge steel capacity.
Hydraulic Car Wheel Press, 8' between end frames, 6' between horizontal frames.
Waterbury-Farrell 400 ton knuckle joint press, short stroke.
Conveyor type 30' multi-stage drying oven.
Clearing horizontal draw bench 340 ton.
2 complete units of annealing and tempering furnaces, 36' and 42' long.

JOHNSON MACHINERY CO.
222 Market Street, Newark, N. J.
Mitchell 2-6415 Mitchell 2-2013

PUNCH PRESSES

IMMEDIATE DELIVERY FROM STOCK

No. 4½ BLISS, 80-100 Ton Capacity straight side punch press, late model with scrap cutters, double roll feeds, bolster. 10 H.P. motors and controls, forced feed lubrication. 21x27 bolster 4½" stroke. In both Single and Double Action Models. Like new.

No. 6 BLISS 90-125 Ton Capacity, straight side Punch Presses, late model. With scrap cutters, roll double roll feeds, bolster, 15 Hp motors and controls, forced feed lubrication. 25x30" bolster, 5½" stroke. In both Single and Double action models. Like new.

#3 Niagara OBI Punch Presses, 25 ton cap., good cond.

1—#87 BLISS Press, 175 Ton cap. 32" stroke, late model.

#666 Toledo, Knuckle Joint Press. 1000 ton cap. 37x21 bolster, 2½" dist. bed to slide, good condition, all electrical equipment.

SPOT WELDERS IMMEDIATE DELIVERY 5-300 KVA, Brand new. 5 year guarantee.

PAUL'S MOTOR AND MACHINERY SUPPLY CO.
Detroit 8, Mich.
6111 Vermont Ave.
TYLER 76300

MBNA MEMBER

HORIZONTAL BORING MILL

No. 45 GIDDINGS & LEWIS Horizontal Boring Drilling & Milling Machine, Table Type 5" spindle, No. 6 Morse Taper, Table 72"x36".
60 cycle motor drive.

Immediate delivery from stock

O'CONNELL MACHINERY CO.
1825 Niagara St. Buffalo 7, N. Y.
DElaware 3400

USED FARNHAM MACHINERY

. . . in War Surplus centers there are used Farnham forming rolls, countersinkers, millers, drilling machines and other equipment in good condition. We can arrange to purchase, recondition and modify this equipment to fit your current needs.

Inquiries invited

FARNHAM
MANUFACTURING COMPANY
1646 SENECA ST., BUFFALO 10, N. Y.

IN STOCK

LATHES

12"x18" Lipe Carbo, M.D.
18"x6' American Grd. Hd.
18"x48" Monarch, Keller attachment (1942)
20"x10" Lodge & Shipley Grd. Hd.
22"x48" Monarch, (1943)
36"x30' Lodge & Shipley Triple Geared Selective Head, two carriages
42"x18' Putnam Geared Head
42"x30' American Grd. Hd.

MILLING MACHINES

#3 Milwaukee Vert. M.D.
#3K Milwaukee Vert.
#3H Milwaukee Plain (1942)
No. 4 Cincinnati Plain, Motor Drive
No. 4K Milwaukee Plain Late Type
No. 118 Van Norman Production
24" Cincinnati Production
Taylor & Fenn Spline
No. 27MB Smalley General Thread
#2 Hanson-Whitney Thread
No. 6 Lees-Bradner Thread
26"x25"x12' Ingersoll Adjustable Rail
42"x36"x14' Ingersoll Adjustable Rail, four heads

DRILLS

No. 2-8 Spdl. Leland-Gifford
7' American full Universal Radial

VERT. BOR. MILLS

34" King
42" Bullard New Era Vertical Turret
8' Cincinnati

HOR. BOR. MACHINES

No. 50 Universal, 5" Bar, 60x144" Table, Maximum Bar to Table 72", Maximum Bar to Outboard 120".
2½" Bar Universal, Motor Drive

GEAR MACHINES

No. 7 Fellows Gear Shaper
12" Michigan Gear Shaver

PLANERS

36"x36"x8' Woodward & Powell

TURRET LATHES

No. 2 American Brass Lathe, M.D.
No. 2 Brown & Sharpe, Wire Feed
#3 W & S Univ. Bar Feed (1940)
No. 1-A W & S Univ. Speed Selector (1941)
No. 5 Jones & Lamson Univ.
No. 5 Jones & Lamson Univ.,
No. 4-A W. & S., 8" hole (1940)
#4—W & S 1½" Screw Machine
#6—W & S 2" Screw Machine
#6R Denver Univ. 2-9/16" capacity
18" Libby—3½" Hole—M.D.

GRINDERS

#22—12" Heald Rotary Surface
10"x24" Landis Universal, M.D.
No. 16 Blanchard Surface, 26" chuck
No. 34 Abrasive surface
No. 2 Cincinnati Tool & Cutter
Norton Motor Driven Grinders practically all sizes from 6x18 to 24x240.

HILL-CLARKE MACHINERY COMPANY
651 Washington Boulevard
Chicago 6, Illinois

REYNOLDS
for Used Machinery Quality
at LOW PRICE

. . . for example

5 — #262 Barnes 1-spindle Drills, 2" capacity
2 — #262 Barnes 2-spindle Drills, 2" capacity
8 — #2LMS 26" Leland-Gifford 1-spindle Drills
6 — #2LMS 26" Leland-Gifford 2-spindle Drills
1 — #2LMS Leland-Gifford 3-spindle Drill
1 — #1LMS Leland-Gifford 3-spindle Drill, ⅜" cap.
3 — #22 Heald 12" Rotary Surface Grinders
1 — #25A Heald 24" Rotary Surface Grinder
3 — 6" x 18" Norton type "C" Cylindrical Grinders, (used 3 months or less)
2 — #2K Kearney & Trecker Vertical Millers
1 — #3K Kearney & Trecker Vertical Miller
3 — #4H Kearney & Trecker Vertical Millers
1 — #500 Standard Automatic Drop Hammer (NEW)

Hundreds of other machines in stock.

REYNOLDS MACHINERY CO.,
305 EDDY STREET PROVIDENCE 3, R. I.
GAspee 5187

LATE TYPE—

12"x30" LeBlond Grd. Hd., M.D., Lathe
16"x30" Monarch Grd. Hd., M.D., Lathe
18"x48" Monarch Grd. Hd., M.D., Lathe
22"x48" Monarch Grd. Hd., M.D., Lathe
22"x48" L. & S. Grd. Hd., M.D., Lathe
22"x11' Lehman Grd. Hd., M.D., Lathe
#2 Cin. HS. Dial Plain Mill
No. 3K—K. & T. Plain Mill, M.D.
#4—48" Cin. Hydro Dup. Mill
No. 3 SU Van Norman Universal Mill
No. 1A—W. & S. Preselect Grd. Hd., Uni.
3'9" Cinci-Bickford Radial Drill, M.D.
3'11" Cinci-Gilbert Radial Drill, M.D.
4'11" Carlton Radial Drill, M.D.
6 Spindle No. 3B Edlund Drill, M.D.
No. 25A Heald Rotary Surface Grinder, 16" type A B & C Gear Hobber
#3 B & C Gear Hobber
Type A Barber-Colman Gear Hobber
#3 Cinci. centerless Grinder

New Logan Lathes, all models in stock
7" Logan shapers M.D.

GEORGE M. BERNSTEIN & COMPANY
12 So. Clinton St., Chicago 6, Ill.

MORRIS OF NEWARK

OFFERS

Norton 16x36 Multipurpose Universal Grinder 220/3/60 D.C. live spindle mfd. 1942, Condition A-1.

Brown & Sharpe #2 Std. Vert. Miller P.F. Table 54x14 M.D. by 7½HP, 220 or 440 volt, 3ph., 60 cyc., A.C.

Thompson 8x24 Hydraulic Surface Grinder with D.C. chuck M.D. 208/3/60 A.C. (1940) condition excellent.

Cincinnati #3 Plain Miller rectangular overarm table 60x16½ M.D. by 10 HP 440/3/60 A.C. motor.

Bullard 42x24" Vertical Turret Lathes, arr. for motor drive, no motors.

Giddings & Lewis Type 30 Horiz. Boring Mill 3" bar and 2" aux. high speed bar M.D. by 10 HP, 220/440-3-60 A.C. motor (1936) excellent condition.

Cincinnati-Bickford 5'-13" Col. & 6'-13" Col. Radial Drills, single pulley drive thru gear box, no motors.

Greaves & Klusman 27" raised to 34" swing geared hd. q.c.g. lathe 21' bed, 12'6" centers, taper att., chucks, CR & FR arr. for M.D. No motor.

Pratt & Whitney 30" Vert. Miller & Profiler M.D. by 3 HP-208/3/60, 1150 R.P.M. motor & magn. control.

Edlund #3B four spindle drills 15" O.H. 2 M.T. spdls., each spdl. individually M.D. by 1 HP, 208/416-3-60 A.C. Motors & Control

Morey #12M, 2 spdl. Vert. Profiler M.D. by 220/440-3-60-AC (1941).

Pratt & Whitney 13x30 geared head, 16 speed Lathes M.D. by 3 HP/1½ HP, 440v, 3ph., 60-cyc., AC two-speed motors.

Brown & Sharpe #1 Universal Cylindrical Grinders M.D. 440/3/60 AC Motors.

Warner & Swasey #1A, #4, & #6 Univ. Turret Lathes MD 220/3/60 AC.

Heald #72 Sizematic Internal Grinder, hydraulic feeds, C/S drive.

Cincinnati 48" Duplex Production Millers M.D. 220/3/60 AC.

Hardinge Elgin 1" cap. Hand Screw Machine on cabinet M.D. by 220/3/60 AC two speed motor.

Above selected at random from our large stock—your inquiries appreciated

MORRIS *Machinery Company, Inc.*
101 Chestnut St. OF NEWARK, N. J.

SHEET METAL MACHINERY

NEW — IN STOCK

Squaring Shears, power and foot.
Power Presses—Foot Presses.
Pittsburgh Lock Machines.
Forming Rolls, power and hand.
Brakes—Folders—Punches—Stakes.
Spot and Arc Welders—Rotary Machines.
Di-Arco Shears, Brakes and Benders—many other items.

USED GUARANTEED MACHINES

#45 md. Buffalo Punch 5/8x5/8, 12" throat.
#610 md. Pexto 10 ga. Bender
#62 Chicago POWER BOX BRAKE 6'x19 ga.
18'—18 ga. Chicago Steel Brake.
8'—16 ga. Chicago Steel Brake.
8'—14 ga. Chicago Steel Brake.
#1 Gray Punch Type Nibbler 3/16"x34" throat.
#14 Lockformer Power Flanger md.
300 amp. Hobart & Wilson Arc Welder.

Other machines—send your inquiry.

MONA MEMBER **B. D. BROOKS, INC.**
361 Atlantic Ave., Boston, Mass.

#202½ V&O TRIMMER
#615 Fellows GEAR SHAPER
#3 Barber Colman GEAR CUTTER
6—#2 Manville SCREW SLOTTERS
20—#4 Bliss horizontal PRESSES copper feed, m.d.
20—#14 Diamond O.B.I. new M. & D. PRESSES

AUSTIN D. LUCAS and COMPANY, INC.
125 LINDLEY ST. BRIDGEPORT 8, CONN.

IF YOU DON'T SEE WHAT YOU WANT
—ask for it!

Quoting the storekeeper's old slogan: "If you don't see what you want—ask for it." Ask the advertisers. They are constantly adding to their stocks and may have acquired just what you need. Or, shall we ask them for you? Write the

Classified Advertising Division
AMERICAN MACHINIST
330 W. 42nd St., New York 18, N. Y.

HAZARD BROWNELL

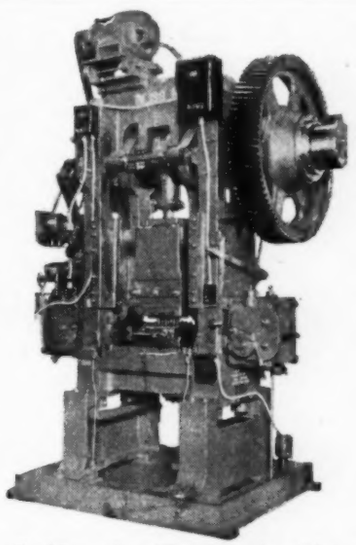
OUTSTANDING FOR VALUE AND PROMPT SERVICE

- 84" Cincinnati HYPRO Vertical Boring Mill
- 16"x72" Norton Plain Cylindrical Grinder
- 5'-17" Cincinnati-Bickford Radial
- 24"72" American HIGH DUTY Lathe
- 12"x30" Monarch "CK" Tool Room Lathe
- 7½" Goss & DeLeeuw 6-spindle AUTOMATIC CHUCKING MACHINE
- #3 Allen 3-spindle Motor Drill, PF, #4 M.T.
- #3 and #4 Warner & Swasey Universal Turret Lathes
- #5 Jones & Lamson Universal Turret Lathe
- #262 Barnes Upright Drill

HAZARD BROWNELL
350 Waterman Street, Providence 6, R. I.
Dexter 8880

TREMENDOUS STOCK AT REDUCED PRICES

LATHES, TURRET LATHES, PLANERS, MILLERS, GRINDERS, BORING MILLS, PRESSES, THREAD ROLLERS, AUTOMATICS, DRILL PRESSES, BOARD DROP HAMMERS, SHEARS, RADIAL DRILLS, BENDING AND FORMING ROLLS, SHAPERS, TAPPING MACHINES, HEADERS.



Double action, 70 ton each stroke 1943 machine

S & S MACHINERY COMPANY
207 CENTRE STREET NEW YORK 13, N. Y.
War Assets Administration Approved Dealer in Government Owned Surplus Machine Tools

CLOSEOUTS

BORING MILLS

#OGL Spd.
2½" Cleveland Spd.
2¼", 4" Binsee
66" Niles
54" Colburn, M.D., 2 hds.

TURRET LATHES

Foster Nos. 4, 5, 6, 1B, 3B M.D. Univ.
J. & L. 2¼"x24", 3¼"x36".
Acme 3¼" M.D.
No. 1L Gisholt Univ. M.D.

GRINDERS

P. & W. 14", 18", B.B., Vert. M.D.
Blanchard 30", M.D.; Modern 12x48" M.D.
Norton Hydraulic 12x18", M.D.
Heald Nos. 72A3 Gagematic
Norton 50"x28', M.D.
Landis Type A 6x20" Hydraulic, M.D.
Bryant No. 12, M.D.
No. 55, 60, 65 Heald Int. Hydraulic, M.D.
12" Heald Rotary Arter 12" M.D.
B. & S. No. 2, 2B Surface, M.D.
B. & S. No. 10 1 Cyl.
No. 2 Cincinnati Centerless M.D.
B. & S. No. 1, 3 Universal
#25, #55 G. & L. M.D.
#25A Heald M.D.

LATHES

Monarch geared head
McCabe 26-42"x14'
26x12' Boye & Emmes 3 step cone, B.D.G.
14"x6', 16"x6' Hendey
9" LeBlond Automatic
36x30' Putnam M.D.
36x22" Putnam, D.C. M.D.
32"x35' Wickes
Putnam 42x16', M.D. S.C.G.
P. & W. 1x18, 1¼x18 Automatic Lathes

AUTOMATICS

B. & S. No. 2, Hand Screw
Cleveland Model A ½", ⅞", 1¼", 2"
Cleveland Model B 1", 2"
P & J 6A, M.D.
⅞" Cone 4 spindle

New In Stock—Power Shears 52" and 72"

Spot & Arc Welders
5, 10, 18 ton OBI Power Presses
7" Ammco Shapers
H.S. Vertical Milling Heads, Drill Presses, Foot Presses
Kalamazoo Metal Band Saws
8" Shap-Rite Shapers
No. 1½ Abrasive Surface Grinder
6x6" Racine Hacksaw

RADIALS

4', 5', 6' American Triple Purpose
4', 5' Cincinnati-Bickford
4' Muller, M.D.; 4' 5' Western, S.P.D.
4' American Hole Wizard, M.D.
4' Fosdick

MILLING MACHINES

Cincinnati, #2 Univ.
No. 3S Cincinnati, S.P.D. rapid trav. M.D.
Nos. 1Y, 0Y, 3, 4 5 B & S Plain & Univ.
B. & S. Nos. 12, 13, 13B
Hall Planetary Model D Thread Miller
Becker Nos. 3, AB, 5, 6, Vert.
Nos. 3, 4, Cincinnati Vert.
P. & W. No. 12, 30 Profiler M.D.
K. & T. B. & S., No. 2, 3 like new
B. & S. No. 1, 3, Vert.
No. 8D, Gorton Vertical, M.D.
#3 Van Norman Universal
#2 Conradson Universal
#22L, #26 Van Norman Univ.

MISCELLANEOUS

Gorton No. 1S Engraving Machine
6 spindle Avey Drill 15" overhang
Rochester No. 5½" B Hammer
6" Vertical Shaper P & W
Oster Pipe Machines, 4", 6", M.D.
N.B.P. 15" Slotter M.D.
10x10 Peerless Universal Shaping Saw
#7 72 Fellows Gear Shapers
Lennox Throatless shear ¼" cap., M.D.

AARON MACHINERY CO., INC.
MMA MEMBER
45 Crosby St.
New York 12, N. Y.

No. 2 Cincinnati Plain High Power Mill
No. 3 Abrasive Surface Grinder
14"x6' Rockford Lathe
MONA MEMBER
D. E. DONY MACHINERY CO.
47 Laurelton Road, Rochester 9, N. Y.

Belt Cutters 1"-1⅛"-2"-2½" Acme Landis
Boring Mills, 36"-42"-52"-72"-96"
Drills, Radial 6' Cin. Bick., 5' Carlton.
Lathe, Turret 3-A W. & S. S.P.D.
Millers, Plain No. 3 K & T. No. 4 Cin.
Planer, 36"x36"x12' Powell 4 Hds.
Profiler, #13 P. & W., B.D.
Shapers, 16"-20"-24"-36"
Shaper, 36" Morton Draw Cut
West Penn Machinery Company
1210 House Bldg. Pittsburgh, Pa.

DRILL, RADIAL—FOSDICK, 3½". G.B., M.D.
KEYSEATER—MITTS & MERRILL No. 6, M.D.
MILLER, PLAIN—MILWAUKEE No. 2-B Double Over-arm, M.D.
PLANER, MEAL—WOODWARD & POWELL 30"x30"x8' 1 rail head, 1 side head
TURRET LATHES—FOSTER No. 1-B Univ. Inc. 2 Wrenchless Chucks, etc. M.D.; also W & S No. 2-A Univ.
Available immediately—Also Many Other Tools
ALEX ZEEVE & COMPANY
2269 Woolworth Bldg. New York 7, N. Y.

SENECA FALLS 4" LO SWING PRODUCTION LATHE
VERY LOW PRICE on this powerful high production lathe, 60" centers; geared head; 9 speeds on carriage, 6 speeds on spindles; 8 tools and cross slides; 5 h.p. 3 ph. AC motor; hardened steel ways and gears. For work on heavy steel forgings; does several operations at one time.
JAY SALTER
306 ROSEDALE ST., ROCHESTER, N. Y.

SEARCHLIGHT SECTION

BORING MILLS

96" Cincinnati Vertical; 2 hds. on rail; M.D.
72" Colburn Vertical; 2 heads on rail; M.D.
72" Niles-Bement-Pond Vert.; 2 hds.; M.D.
52" King Vertical; 2 heads on rail; M.D.
24" & 36" Bullard New Era Vertical; M.D.
#35 Landis Floor Type Horiz.; 3½" bar; M.D.

RADIAL DRILLS & DRILL PRESSES

6' American Triple Purpose; M.D.
6' Cincinnati Bickford Universal; M.D.
5' & 6' Cincinnati Bickford; M.D.
6' Niles-Bement-Pond Semi-Univ.; M.D.
D2 Colburn Heavy Duty Drill; M.D.
12-spindle Pratt & Whitney; M.D.

GEAR HOBBERS

#84-H Gould & Eberhardt; M.D.

GRINDERS

16"x72" Norton Model "C" Cylindrical; M.D.
16"x72" Norton Crankpin; M.D.
#44 Ex-Cell-O Double End Carbide Tool; M.D.
8"x48" Jones & Lamson Thread Grinder; M.D.

TURRET LATHES

#2A, 6, 4 & 2 Warner & Swaseys; M.D.
#5 Foster Universal; M.D.
24" Gisholt; taper attachment; M.D.
#6 Brown & Sharpe; M.D.
16"x21" and 20"x25" Fay Automatics; M.D.

LATHES

84"x52' Putnam; 2 carriages; Rapid Traverse; M.D.
36"x32' Lodge & Shipley Selective Geared Hd; M.D.
42"x28' Bradford.
27"x16' American Geared Head; M.D.

MILLING MACHINES

#3 Cincinnati Vertical; Dial Feed; M.D.
#4 Cincinnati Vertical; Intermittent Feed; M.D.
#3 & 4 Cincinnati Vertical; M.D.
#3 & 4 Cincinnati Plain; Rectangular Overarm; Intermittent Feed; M.D.
#4 Cincinnati Plain; M.D.
#2 Brown & Sharpe Vertical.
18" Cincinnati Automatic.

MISCELLANEOUS

BROACH: #4 LaPointe; M.D.
PLANER: 96"x96"x20' Niles-Bement-Pond; 4 hds.; M.D.
SCREW MACHINES, Auto.: #2G Brown & Sharpe; M.D.

SUN MACHINERY CORPORATION
36 VAN VECHTEN ST. NEWARK 5, N. J.

OVERHEAD CRANES

1-TON—Whiting 33' Span
Curtis 24' Span
1½-TON—Shepard Niles 25'6" Span
P & H 34' Span
2-TON—Louden 19'22" Span
Box 36'9" Span
Detroit 28' Span
3-TON—Shaw 33' Span
P & H 25' Span
Northern 22' Span
Manning, Maxwell, & Moore 48¼'
"Cones" 48' and 26'6" Spans
5-TON—Whiting 47'4" Span
38'10½" Span D.C.
Northern 30'9" Span
Milwaukee 70' Span
Milwaukee 66'9" Span
Manning, Maxwell, & Moore 70' Span
Manning, Maxwell, & Moore 47'4" Span
Shaw 36' Span
Champion 37'6" Span
American 70' Span
American 47'4" Span
6-TON P & H 77' Span
American 77' Span
7½-TON—Shepard 36' Span
10-TON—Shaw 68' Span
Shaw 73' Span
P & H 30' Span
P & H 87'6" Span
P & H 80' Span
Northern 71'10½" Span
Northern 60' Span
Morgan 55'6" Span
Morgan 39'5" Span
Morgan 52'3" Span
Milwaukee 66'9" Span
McGill 85' Span
Lane 50' Span
Emsee 75' Span
Dominion 35' Span
Cleveland 38½" Span
Cleveland 50' Span
Alliance 71'10½" Span
Alliance 58'9" Span
Albany 60' Span
15-TON—Whiting 71'-10½" Span
Northern 53' Span
Erie 60' Span
Chesapeake 55'6" Span
Case 51' Span
20-TON—Shepard Niles 49'6" Span
P & H 51'4" Span
Northern 60' Span
Morgan 60' Span
Cleveland 65' Span
25-TON—Whiting 106' Span
Tysaman 60' Span
P & H 70' Span
Morgan 52'3" Span
Cleveland 106' Span
Case 63' Span
Bedford 56' Span
30-TON—Whiting 80' Span
P & H 80' Span
P & H 60' Span
Morgan 30' Span
Case 41' Span
35-TON—Bedford 50' Span
Northern 22' Span
50-TON—Shaw 95' Span
Shaw 69'10" Span
Dominion 80' Span
Cleveland 71'10½" Span
75-TON—Morgan 59'2½" Span
Alliance 78' Span
Alliance 37' Span
90-TON—American 46'6" Span
125-TON—Morgan 100' Span
150-TON—Whiting 50' Span
175-TON — Morgan 54' Span
200-TON—Alliance 100' Span

Telephone us collect to discuss your requirements.

ECONOMY COMPANY, Inc.
49 Vanderbilt Avenue New York 17, N. Y.
Tel. MUrrayhill 4-2294, 4-2893, 4-2295, 4-2844, 4-2296, 4-2892

When Thinking of

AUTOMATIC SCREW MACHINES

Contact R. V. OSMUN, INC.

Largest listing of both Government and Privately Owned Automatic Screw Machines

NATIONAL ACME — NEW BRITAIN GRIDLEY CONOMATIC — GREENLEE — BROWN & SHARPE

Specializing in Automatic Screw Machines for Years
Good Service — Quality Merchandise —
Attractive Prices

R. V. OSMUN, INC.
406 BLOOMFIELD AVENUE BLOOMFIELD, N. J.
Tel.: BLOOMFIELD 2-7640

MILLING MACHINES

Latest type and design

#1 B & S Plain light type
#2LP Van Norman Plain
#2 Cinc. Plain H.S. Dial
#2K K & T "Milw" Plain
#3H K & T "Milw" Plain
#4 Cinc.—Plain—Dial type
[illegible] Van Norman PRT
#08 Cinc. Rise and Fall Prod.
#1 U. S. Hand—MFG Atlas Bench

SHEAR

Dreis & Krump 8'x3/16"—Power Squaring—18" gap—220/3/60 4 sets blades—all steel—late model

OTHER MACHINE TOOLS

DRILLS

3'-11" Carlton Radial—1942
4'-11" Cinc.-Bickford Radial—GB—SPD
3'-9" Western Radial—1941
4 spdl—Sipp—T&L
4 spdle—Allen—T&L Natco D5 Mutliple

LATHES AND TURRETS

16"x54" Reed-Prentice—16 spd.—1942
18"x6' Sebastian—NEW
24"x10' Blaisdell—LCG—CD
2" Foster Turret—FH.PF
#2 W & S Turret
10" Logans—NEW—all models

MILLING MACHINES

#1 Kempsmith plain—CD
#1 B & S Vertical—CD
#4B Becker Vertical—CD
#2A Gervin Universal—CD
24" Cinc. Duplex

SHAPERS

20" Gemco—NEW
7" Logan—NEW

MISCELLANEOUS

Shear #316B—Rotary Slitting
Fo[illegible]ron
#1A Gorton Etcher & Engraver
Gear Cutter—Pfauter #0—14" Univ.

UNITED MACHINERY & TOOL CORP.
35 Hermon St., Worcester 8, Mass.

UNUSUAL VALUES

Blueprint machines, printer-washer-dryer
Rivett Ball Brg. Precision Screw-Machine
Simmons No. 1A Micro Milling Machine
Drills, high speed single & multiple spindle
Drills, 21" Royersford Bk. Grd. Pr. Feed, New
Drills, sensitive, 2 and 4 Spindls
Drill, #25 Foot-Burt ,motor driven
Drills—New—18" Royal Motor driven (10)
Gear cutter, Brown & Sharpe #3—36
Gear Cutter, Gould & Eberhardt 42"
Grinder, Webster and Perks #1-¾ motor drive
22" Buffalo Pr. Fd. Motor Drive, New
10"x8' Hendey Lathe, Quick Change Gear
Magic Chucks #1-2 & 3 and Collets
Pipe Machine, 3" Oster motor drive
Planer 24"x24"x6' Pease, motor drive
Punch & Shear, two ½" & ⅝" capacity
Shaper, 24" Gould & Eberhardt
Turret Lathe, 2" Acme & Warner & Swasey
Welders—Arc & Spot in Stock—New

Outfit: about 27 fine machine tools, drills, lathe, and 5 milling machines, plain and Uni. Tel us definitey what you want as our list is incomplete and only partial.

The above list is only a fraction of our stock which changes almost daily, therefore, tell us definitely what you want since we are adding considerable number of machines to our stock which are too many to list. What we have today may be sold tomorrow, so a list is really not dependable.

THE OSBORNE & SEXTON MACHINERY CO.
COLUMBUS, OHIO

NEW

Power Presses 52" & 72"

Spot & Arc Welders

Abrasive No. 1½ Surface Grinders, M.D.

Racine 6 x 6" Hacksaws, M.D.

AARON MACHINERY CO., INC.
45 CROSBY STREET NEW YORK, N. Y.

POWER PRESSES

BLISS 304—58 ton, 8" stroke, 18" x 18" bed

CLEVE 10S— 90 Ton, 8" stroke, 22"x22" bed

CLEVE 14E—225 Ton, 1" stroke, standard bed

BLISS 7—180 ton, single and double act. 1½-4½" stroke, 24"x36" Bed

BLISS 7—88 ton, 4-8" stroke, Horizontal Horning

BLISS Hydro-Dynamic 100, 150, 200 ton adj. stroke, 30"x31" Bed

NATIONAL MAXIPUS NO. 6, 2000 ton, 12" stroke, 46"x54" bed

BLISS 88—226 ton, 10-30" stroke

BLISS 26A—800 ton knuckle

BLISS 27—1000 ton knuckle

CLEVE 14S—180 ton, 8-30" stroke

CLEVE 8K—800 ton knuckle, 6" stroke

CLEARING K 1800—42, 800 ton knuckle 6" stroke

TOLEDO 59½S—504 ton, 8" stroke 31"x 31" bed, twin dr.

Ceco Stamps—24x48, 36x48, 48x48, 60x156
Pneumatic Drop Hammer 36x48 3000# Head
Hydraulic Presses 75 ton to 5000 ton
Planer, Cinci 60"x60"x14'—4 heads
300,000# Draw Bench (NEW) with motor generator for 40 ft. tube, single, double, triple heads

GOTHAM MACHINERY CORPORATION
1775 BROADWAY PLaza 9-4643 NEW YORK 19, N. Y.

BORING MILLS or VERTICAL TURRETS

36" and 42" Bullard "New Era" with swivel turret on crossrail, side head, each with forming and threading attachment, for motor drive. Very good condition.

LATHES

10" Hendey "Gaugemakers" with motor of 3/60/220 in cabinet base, including chuck, collets and taper attachment. Excellent—Can demonstrate.

24/27"x18' Lodge & Shipley Selective Head, for motor drive, with chuck and taper attachment. Very good.

DRILLS

No. 25—36" Foote-Burt Heavy Duty with motor base, cap. 3" in steel. Wt. 3425 lbs. Very good.

METALIZING UNIT

Mogul Gun, cabinet, 200# Blast Unit with welding rods and shot. Condition near new.

MILLING MACHINES—Universal

No. 2-SU. Van Norman with motor 3/60/220-440 V. in base. Excellent.

No. 2-B. Hendey and No. 3 Kempsmith, cone, index heads. Fair condition.

PRESSES

No. 62 Bliss O.B., 4" stroke, V-belt Motor Drive 3/60/220-440 V. with adjustment to ram. Near new. (2)

WELDERS—Spot

7½ KVA. Universal, 12" & 18" arms, 60/220. Like new. (2)

GALBREATH MACHINERY CO.
Empire Building, PITTSBURGH, PA.

GOOD VALUE!
GOOD SERVICE!

SELLING
HIGHEST CLASS MODERN MACHINE TOOLS

BUYING
USED MACHINE TOOLS OR COMPLETE PLANTS

FAST ACTION—GOOD CASH OFFERS!!

LATE MODEL MACHINES

Blanchard #11 Vertical Surface Grinder, Motor Driven
Gardner #120A Double Spindle Disc Grinder, Motor Driven
Pratt & Whitney Model B Vertical Surface Grinder, Motor Driven
2—Norton Model C Cylindrical Grinders 6"x18" Capacity, Motor Driven
2—Norton #2 Heavy Duty Cutter & Tool Grinders, Motor Driven
3—Queen City #518 Motor Driven 2 Wheel Disc Grinders 18" Dia.
American 3'-11" Column "Hole Wizard" Radial Drill, Table, Motor Driven
(New)—Reed-Prentice 16"x10' Geared Head Engine Lathe, T.A., Pan Bed, Motor Driven
Greaves-Klusman 30"x24' Lathe, Quick Change Gear, Taper Attachment, M.D.
3—Warner & Swasey #4 Universal Turret Lathe, M.D., Pre-Selector on Head
Kearney & Trecker #2K Vertical Milling Machine, Motor Driven
Reed-Prentice #3VG Vertical Milling Machine, Rotary Table, Motor Driven
Stockbridge 18" Crank Shaper, Gear Box, Motor Driven
Savage #412 Nibbling Machine 5/16" Capacity, Motor Driven

JOSEPH BEAL & Co.
DEALERS IN HIGH GRADE
NEW MACHINERY & TOOLS USED
TRADE MARK REG

465-471 ATLANTIC AVE. BOSTON, MASS.

LATE TYPE MACHINES

APPROX. 3 YEARS OLD

Hammond Type J Model SB8—3 head Auto. Polisher; 8 work holding heads; M.D.

American 4' Hole Wizard Radial Drill; 11" col., motor on arm.

Carlton No. 1A—4' Radial Drill; 11" col., motor on arm.

Hendey 12x8' Grd. Head Lathe; Collet att., M.D.

Monarch Model CKK 12x30 Grd. Head Lathe; M.D.

Brown & Sharpe No. 2 Surface Grinder; M.D.

Abrasive No. 3B — 24"x8" Surface Grinder; M.D.

Walsh No. 2A Arch Press; 18"x22" bed, arr. M.D.

Jackson No. 2 Vertical Mill; Power feeds, M.D.

Continental Band Filing Machine; M.D.

Delta Abrasive Cutoff Machine; M.D.

Racine 10x10 Hydraulic Feed Hack Saw; M.D.

Rasmussen 10x10 Power Hack Saw; M.D.

Buffalo No. 0 Angle Roll; Capacity 1½x1½x3/16 angles; M.D.

•

NEW MACHINES IN STOCK

Press-Rite #0, #1, #2 O.B.I. Presses; Arr. M.D.

Edlund No. 2B—8", 1" capacity Drills; M.D.

Edlund No. 4B—12", 1¼" capacity Drills; M.D.

Libert No. 1430 High Speed Shear; Cap. 14 ga., M.D.

San Angelo 4x74 Forming Rolls; Cap. 16 ga., M.D.

Economy 36" Foot Power Shears; Cap. 16 gauge.

Larkin Spot Welders 5 to 75 KVA Foot & Air Operated.

•

MISCELLANEOUS

Williams & White 29U Bulldozer; 300 ton cap., M.D.

Fellows No. 61 Gear Shapers; Arr. M.D.

Foster No. 3B Univ. Geared Head, M.D.

Warner & Swasey 4A Turret Lathe; Grd. Hd., Arr. M.D.

Cincinnati No. 2 Plain Mill; Geared head; Arr. M.D.

LaPointe No. 3 Double Broach.

Marvel No. 8 Band Saw Machine; Arr. M.D.

Pratt & Whitney No. 2 & 3 Die Sinkers.

Partial Listing Only

ACME
EQUIPMENT COMPANY, INC.
126-128 So. Clinton St., Chicago 6, Ill.
AND. 3430

MONA MEMBER

SEARCHLIGHT SECTION

LATEST TYPE MACHINE TOOLS
A Few Years Old—Immediate Delivery

MILLERS

#2 light type Brown-Sharpe, plain miller double over-arm, m.d.
#2K Kearney & Trecker plain miller motor in base
#3H Kearney & Trecker plain miller motor in base
#4H Kearney & Trecker plain miller motor in base
#2L Brown & Sharpe universal miller double overarm, motor drive universal equipment
#2D Kearney & Trecker rotary head tool and die miller motor in base
#2H Kearney & Trecker Vertical miller motor & base
#2LP Van Norman miller with rect. overarm motor & base
#12 Van Norman miller motor drive
#22L Van Norman miller

LATHES

10"x20" Monarch lathe Model EE taper attachment
12"x30" Monarch lathe Model C taper attachment
20"x8' American geared head lathe, Timken bearing motor in base, taper attachment
24"x11' American lathe 6½ ft. centers 12 speed geared head Timken bearing Taper attachment

TURRET LATHES

#2A Warner & Swasey Universal turret lathe motor in base automatic chucking & bar feed
#3 Warner & Swasey universal turret lathe motor in base automatic chucking & bar feed
#4 Warner & Swasey universal turret lathe, with preselector head, motor in base

SHAPER

24" Cincinnati shaper, motor drive

DRILLS & RADIAL DRILLS

30" Cleereman drills box column type, motor drive, coolant pump
#1B 12" 4 spindle Edlund drill press, each spindle individually motor driven
3'9" American hole wizard radial drill
5'17" Carlton Radial drill motor on arm
4'9" Cincinnati Bickford radial drill motor on arm

WIENER MACHINERY CO., INC.
216 LAFAYETTE ST. NEW YORK 12, N. Y.

2—#4 ATKINS METAL BAND SAWS—BUILT IN MOTORS—3 speeds—12"x18" Capacity —practically new—$375.00 each.
MOTCH & MERRYWEATHER—WAGNER COLD SAW—CAP. 12"—with 38" Inserted Tooth Saw Blade, MD. $2000.00.
LOVELL ADJUSTABLE FLANGING MACHINE —CAPACITY 16 GA. $350.00
30"x10' MESTA REBUILT PLANER, BOX TABLE, REVERSING MOTOR DRIVE, 2 HEADS ON RAIL. $1750.00. With or without MG Set.

ELECTRIC FURNACES—60 CYCLE

2—6 TON HEROULT 1—1 TON HEROULT—1—2/4 TON HEROULT
2—6 TON LECTROMELT—ALSO 1½, 2, 3 and 25 TON LECTROMELT

TRANSFORMERS

2—10,000 KVA POWER 13,200 to 4600 VOLTS
2—2000 KVA; 2—3000 KVA; 2—4000 KVA—FURNACE 13,200 V. to 239/89

H. J. KOONTZ
MASSILLON, OHIO PHONE 8180

1A Pratt & Whitney Jig Borer, M.D.
2K Kearney & Trecker Plain Miller, M.D.
#3 Cincinnati Plain Miller, M.D.
14" and 16" Monarch & American lathes

VICTOR MACHINERY CO.
135 SO. CLINTON ST., CHICAGO 6, ILL.

HEADLINERS

16x8 L&S Selec. GH Lathe, MD, taper
18x8 Sebastian GH Lathe, MD
18x14 Sebastian Lathe, 3 SCD, QC
#1B Milwaukee Plain Miller, DOA, MD
#4A B&S Univ. Miller, arr. MD, div. hds.
#3 Van Norman Miller, HS head
6x48 P&W Thread Miller, MD
Beaman & Smith Slab Miller, 18x10', MD
16" G&E HD Shaper, univ. table, MD
28" G&E HD Shaper, Lima drive
24x24x8 Gray Planer, 1 hd, BD
36x30x20 Gray Planer, 2 hds, MD
6x36 P&W Plain Grinder, MD
10x36 Cincinnati Model ER Hydr. Plain Grinder, MD, new 1941
#3 Abrasive 8x22 Auto. Surf. Grinder, MD
16" Heald Rot. Surf. Grinder, MD
#124—53" Gardner Vert. Spdle, Surf. Grinder, MD
#510 Oliver Drill Grinder, MD
#1½ Gallmeyer & Livingston T&C Grinder, MD
#3 Barber-Colman Gear Hobbers, latest
#18H G&E Gear Hobber, MD
11" Gleason Str. Bevel Gear Generators, MD
#2B Foster Univ. GH Turret Lathe, MD
3½x36" Acme Flat Turret Lathe, MD
3¼" bar Morris Horiz. Boring Mill, MD
10" P&W Slotter
Radiac Abrasive Cut-Off Machine, MD
#5 Greenerd Fl. Type Arbor Press

COX MACHINERY CO.
P.O. Box 1953 908-910 Keith Bldg., CINCINNATI, OHIO

FOR SALE—GEAR PUMPS

Well known make, small fluid gear pumps, with overload relief valve. 3 G.P.M. at 1000 PSI maximum, with 3 HP motor. Overall 4¾x4½x3⅛ flange mounting. $25.00 each in small quantities. Price for large quantities upon request.

IDEAL DEVELOPMENT CORP.
UNDERHILL BLDG., BUFFALO 2, N. Y.

FOR SALE

2 new Van Norman Rotary Grinders #444
2 almost new Landis Cylindrical Grinders, type H, 4"x12"

At a great sacrifice

EAGLE PRECISION MFG. CORP.
35-37 36th St. Long Island City N. Y.
Astoria 8-9330

Factory & Mill Supply Co., Inc.
Established 1907

New and Used
MACHINE TOOLS

Manufacturers' Representative
Open for Agencies

176 Federal St., Boston, Mass.

PROMPT DELIVERY FROM OUR WAREHOUSE:

#412 New Britain Gridley 4 Sp. Automatic chucking Machines (3)
36" Niles Vertical Boring Mill, 2 heads
Foot-Burt Horizontal Boring Mill 3" Bar
Beaman & Smith Horr. Boring Mill, 3" Bar
Model R-14, Seneca Falls Automatic Le-Swing Lathes (8)
Model LR, Seneca Falls Automatic Le-Swing Lathes (3)
K & T Milwaukee Model M-24 Simplex Manufacturing Mill
Cincinnati Model 0-8 Vertical Manufacturing Mill, Rotary Table
Cincinnati Automatic Production Mill
Coulter Model H Hob Thread Millers (5)
Lees Bradner Model 40 Thread Millers, (2)
#3 Le Blond Plain Miller, 72"x10" Tabe working surface.

CONTINENTAL SALVAGE & MACHINERY CORP.
1836 Euclid Ave. Cleveland 15, Ohio

IF
there is anything
you want . . .

that other readers of this paper can supply

or—
something
you don't want

that other readers can use, advertise it in the

SEARCHLIGHT SECTION

Abrasive Cut-Off Wheels

Approximately 1500 used abrasive wheels, 9 to 10" O.D. x ⅞", 1" and 1¼" I.D. x ⅛" and 3/16" thick. Manhattan grades 209, 211, 216 and 239. Can be used on ferrous and non-ferrous metals.

Rotary Cutters/Files

Approximately 4600 used and reground Graham Type G-38 and Severance BGC rotary cutters/files.

Quote your price on entire lot or any portion of either item. Anxious to move to clear space now occupied.

LEBANON STEEL FOUNDRY
LEBANON, Pa.

FOR SALE

Model 25 Thomson Gibb Circular Seam Welder, 30" Throat and 150 KVA.

Thomson Gibb Traveling Jig Longitudinal Seam Welder.

Machines are in excellent condition. Both equipped with Westinghouse Timers. Offer made subject to prior sale. Equipment located in Newark, N. J.

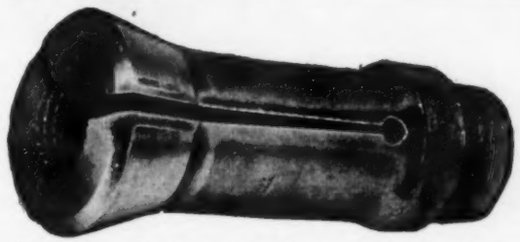
FS-844, AMERICAN MACHINIST
330 W. 42nd St., New York 18, N. Y.

McDONALD
USED MACHINERY

G & E 24" Cin. 32" Shapers
Cleveland O.S. Planer 36"x8', 2 hds.
Abrasive #3-B M.D. Horiz. Surf. Grinder
Cincinnati D. H. Planer 36"x36"x10', 2 hds.
Barnes geared Camelback Drill Press, 4 sp.
Bullard Vert. Turret Lathes, 24" & 36" S. Head
Defiance 3" Horiz. Boring Mill & Univ. #3-A
L & S 18x12' & 20'x10' 20"x8' Grd. Hd. M.D.
& 28"x12' Lathes
American 24'x12 grd. hd. lathe, m.d. q.c.g.
Amer. 4-ton vert. Hydr. Broach
Blanchard Vert. Surf. Grinder, 26 rd. chuck.
Cincinnati #2 Centerless Grinder.
Colburn 60" & 72" Vert. Boring Mills
Cincinnati 1-M grd. hd., Univ. tool room Miller.
Cincinnati No. 5 H.P. grd. hd. S.P.D. Pl. Miller.
Milwaukee No. 3-B Vert. Miller grd. hd., m.d.
Cin-Bick 3' Super Serv. Radial
Gisholt 3R Grd. Hd. M.D. Turret Lathe
W.&S. No. 2A grd. hd. Univ. Turret Lathe, S.P.D.
Foster No. 2F Fostermatic grd. hd. Turret Lathe, M.D.

McDONALD MACHINERY CO.
1531-35 N. B'way., St. Louis 6, Mo.

LARGE STOCK OF NEW & USED COLLETS



Also—Feed Fingers—Pads—Threading Equipment & Parts—Double Deck Tool Holders—Cams.
R. A. 6 Gridley Automatics—1¼", 1⅜", 1⅝", 2⅛".
Mod. 60 & 61 New Britain—Namco Die Heads.
Collets for Gridley Model F, ¾", ⅞", 1¼", 1⅜", 1¾", 2¼, 2⅜", Automatic Mach.
Extra large stock of 2⅜" R.A. 6 Gridley parts and collets.

We have a large stock of used collets and parts for Acme, 52, 53, 55 & 56, Acme Gridley, Cleveland, Cone, Foster, No. 4 and No. 6 Warner & Swasey, Bardons & Oliver, Brown & Sharpe, Garvin and New Britains.

GRAFF MACHINE TOOL COMPANY
7139 So. Halsted Street *Vincennes 9664* **Chicago 21, Ill.**

16"x6½ ft. American Geared Head Lathe

No. 2-B Kearney-Trecker Milwaukee Miller, Dbl. Overarm

10-35 Ton Hydraulic Presses, 24x24, 4 Posts, 2½" Booster Ram, with Pump and Motor—Like New

Bliss No. 403 Geared Press, SS, Motor Driven, 8" Stroke, Air Cushion—Platen, 27x27, Side Shear, Tie Rod Construction, 7" Crank

6" P.W Vertical Slotter

21" Racine Hydraulic Hacksaw

THE ELYRIA BELTING & MACHINERY CO.
ELYRIA OHIO

THREAD GAGES — PLUG AND RING

Slightly used, NF-2 & 3, ¼ to 1", 6, 8, 10 M.S. Also 1 to 4" N.S.
LESS 75 Percent Discount.

ADJUSTABLE SNAP GAGES. ALL SIZES. ½ to 8".
LESS 75 Percent Discount.

DE WITT TOOL COMPANY
173 GRAND STREET NEW YORK 13, N. Y.
Send For Our Bargain Circular

NEW IN 1943

12"x30" Monarch Model C Tool Room Engine Lathes (9).

16"x30" Monarch Model CY Tool Room Engine Lathes (2).

20"x48" Monarch Model CU Tool Room Engine Lathe.

22"x48" Lodge & Shipley Tool Room Engine Lathe.

4—No. 2G, B & S, High Speed, full auto. Screw Machines. M.D.

No. 3U Warner & Swasey Univ. Turret Lathe.

No. 4 Warner & Swasey, Preselector head, Turret Lathe.

No. 3VG Reed Prentice Vertical Mill (2).

No. 2SP Van Norman Plain Mill.

28" Rockford Hydraulic Shaper.

No. 4-48" Cincinnati Hydromatic Mill.

LAKE MACHINERY CO., INC.
654 W. Lake St., Chicago 6, Ill.

NEW LOW PRICES ON GOVERNMENT OWNED SURPLUS STANDARD MAKE PRODUCTION MACHINERY

Clayton Formula Prices Cut As Much As 65% On New Fixed Price Machinery Schedule—Regardless of Age.

We Can Continue Serving You As Approved Dealers, And Locate For You All Types of Government Surplus Metal Working Equipment At New Low Prices.

WRITE FOR COMPLETE INFORMATION ON OUR SERVICE
WAR ASSETS ADMINISTRATION APPROVED DEALER CONTRACT No. CHI-15

ROBERT W. RICE & COMPANY, INC.
1409 S. MICHIGAN AVENUE CHICAGO 5, ILL.

We Also Have An Increasingly Large Stock of Tool Room and Production Machinery On Hand For Immediate Delivery From Our Warehouse. Lowest Prices. Send Us Your Inquiries. We can make arrangements to accept your old machinery in trade or purchase same outright at highest appraisal value.

PETITT BROS. MACHINERY CO.

If You Want to Buy, Sell or Trade
One Machine or Entire Plant
Consult Us Immediately
FRED PETITT — ALBERT PETITT
OFFICE AND WAREHOUSE
1240 WEST 4th ST. CHERRY 0609
CLEVELAND 13, OHIO

FOR SALE

1—Electric Core Oven—Geo. Koch Sons No. C. D. E17—Used 1 year

2—Simmons No. 2B Micro Speed Turret Screw Machine. Used 2 years

2—Acme Model XL, Single Spindle Threading Machines. Used 2 years

1—Tocco Two Station Electric Brazing Furnace. Used 2 years

1—Gisholt No. 3 Turret Lathe

1—Foster No. 3 Hand Screw Machine

THE ENTERPRISE ALUMINUM CO.
MASSILLON, OHIO

LATE TYPE—*GUARANTEED*—PRICED LOW LIKE NEW—IMMEDIATE DELIVERY

12"x30" Mod. CK Monarch Lathe (1943).
4H Milwaukee Horiz. plain mill. (1943).
3K Milwaukee Horiz. mill. (1943).
No. 2 LSM 4-sp. 20" Lel. Giff. Drill, No. 2 M.T.
No. 2 LSM 4-sp. 26" Lel. Giff. Drill, No. 2 M.T.
No. 3 Cincinnati H.S. plain dial type miller.
No. 2K Milwaukee vertical mill. (1943).
No. 2A Reid Surface grinder (1940).
Model EE 10x20" Monarch turret lathe (1944).
No. 2 Campbell Nibbler, ⅜" cap.
Gorton Munitions Engraver.
22"x48" ctrs. Monarch Model CE lathe (1943).

(ALL AC MOTOR DRIVE)

Licensed Dealer for War Assets Administration

JULIUS J. SCHNEIR & CO.
609 W. Washington Blvd.
CHICAGO 6, ILL.
Dearborn 0268

CONTRACT WORK

WANTED PRODUCT OF CONTRACT WORK

Machinery manufacturing concern with extensive experience desires a product to manufacture on a contract basis or straight contract work.
Manufacturer has modern well equipped machine shop, capable of making small, medium or large machinery, tools, jigs, fixtures, gages, stamping dies, stampings, electronic assemblies, gear drives and small parts of all types. Excellent engineering facilities and good contacts for all types of foundry work are available.

Send for our bulletin #10A

C. W. JARVI MFG. COMPANY, INC.
NORTH ATTLEBORO MASSACHUSETTS

SCREW MACHINE PRODUCTS
To Your Requirements, Capacity 2⅝" Diameter. Production Milling & Drilling.
J. W. BRINSER & SONS
317 GILPIN ROAD WILLOW GROVE, PA.

La Salle Engineering Co.
TOOLS, PRODUCTS, SPECIAL MACHINES; DESIGN & BUILD
CHICAGO
LOS ANGELES
NEW YORK

Screw Machines and Eyelet Machines
We have open capacity for assembly work. Screw Machine capacity up to 2½". Eyelet Machines up to ⅜" capacity. Small size presses available.
Prices Quoted Immediately on Request
THE BLAZYS MACHINE CO.
MIDDLEBURY ROAD WATERTOWN, CONN.

SEND B.P. FOR MFG. COMPLETE ASSEMBLIES
Tool—Jigs—Dies
Screw Machine and Turret Lathe Work
Stampings—Gears
POSSY'S TOOL & MFG. CO.
51 Meadowbrook Buffalo 6, N. Y.

PATTERNS in WOOD and METAL
For All Kinds of Castings, Large or Small
MATCH PLATE WORK A SPECIALTY
Put your pattern problems up to us – we will take care of them.
GENERAL PATTERN WORKS
2233 Buck Street Cincinnati, Ohio

PRODUCT WANTED ON CONTRACT BASIS

● Facilities for tools and dies, stamping, lathe work, tube bending. Good contacts for all types of foundry work. Send B.P. for complete manufacturing and assemblies.

VICTOR EXPERIMENTAL CO.
8700A, Justice Street Elmhurst, N. Y.

Put Your Idle Capacity to Work

Hundreds of metal-working companies are finding profitable business today outside their regular lines. Tell metal-working America—the 100,000 readers of American Machinist—about your facilities. Write

Classified Advertising Division
AMERICAN MACHINIST
330 W. 42nd St., New York 18, N. Y.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

WANTED
EXPERIENCED ENGINEER DESIGNER
for mechanical and electrical work on movable bridges. Location Pennsylvania.
P-836, AMERICAN MACHINIST
330 West 42nd St., New York 18, N. Y.

POSITIONS VACANT

CONTACT MAN Wanted by medium sized Tool & Die shop in Detroit, Michigan, for Pennsylvania area, for Jigs, Fixtures, Multiple Spindle Drill Heads and Special Machinery. Must have very good sources—commission basis. P-827. American Machinist, 520 N. Michigan Ave., Chicago 11, Ill.

WANTED: Experienced Design Engineer to design precision machines and equipment for rebuilding internal combustion engines, principally automotive. Excellent opportunity promising permanency and advancement offered by progressive, old-line company in middle-west. Write today giving complete personnel history, enclosing recent photograph or snapshot. All information confidential. P-838, American Machinist, 520 N. Michigan Ave., Chicago 11, Ill.

EXPERIENCED FIXTURE Designer wanted. Good opportunity for high grade man. Give full particulars as to experience and salary desired. Application will be treated as strictly confidential. Consolidated Machine Tool Corporation, Rochester 10, N. Y.

WE HAVE an opening for a machine tool designer who has had extensive experience preferably in designing large machine tools. For a capable man this is a good opportunity. Give full information regarding age, salary and experience. This will be treated as strictly confidential. P-848, American Machinist, 330 W. 42nd St., New York 18, N. Y.

TIME STUDY Engineer: Large established company located in the South has opportunity for experienced man. Experience in grey iron foundry, cleaning room and machine shop practice preferred. Permanent job. State age and qualification. All replies confidential. P-851, American Machinist, 520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

A COMPANY in lower Connecticut is interested in securing the services of a man capable of designing dies. These dies are usually piercing, blanking and forming, and are used on brass, steel, aluminum and sheet metal. All dies are from small to medium size. The man for this position must have had considerable experience as a diemaker, and experience as supervisor of a tool room. The company is located on the main line of the New York, New Haven and Hartford Railroad and an excellent train service is available from New York or New Haven. P-850, American Machinist, 330 W. 42nd St., New York 18, N. Y.

MANUFACTURER ENGAGED in production of electrical and mechanical signaling devices is interested in securing the services of a man experienced in supervising a department engaged in punch press work and automatic screw machine work. Department employs from forty to fifty people both male and female. The man we need for this position must have had previous experience in the same type of position. Must be willing to locate permanently in the southern part of New England, within one hour's traveling time of New York City. Salary open. P-849, American Machinist, 330 W. 42nd St., New York 18, N. Y.

EMPLOYMENT SERVICE

SALARIED POSITIONS $2,500-$25,000. This thoroughly organized confidential service of thirty-seven years' recognized standing and reputation carries on preliminary negotiations for supervisory technical and executive positions of the calibre indicated through a procedure individualized to each client's requirements. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details. R. W. Bixby, Inc. 266 Dunn Bldg., Buffalo 2, N. Y.

POSITIONS WANTED

TOOL DIE and Model Maker, Also Tool Trouble Shooter, 35 years practical experience, desires connection with progressive concern in Supervisory Capacity. PW-820, American Machinist, 520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

PRODUCTION ENGINEER—25 years of cost cutting, in production, Tooling and industrial engineering, varied metal lines,—Broad successful background in plant and administration, now employed, Medium size firm. PW-840, American Machinist, 520 N. Michigan Ave., Chicago 11, Ill.

GENERAL MANAGER: With ability, experience, tact and initiative. Mechanical engineering and administrative training. Wide and practical experience and demonstrated ability in small and large volume manufacturing. Capacity to direct and get things done profitably. Can build up an organization and get the most out of it. Presently employed as General Manager in full charge. PW-792, American Machinist, 330 W. 42nd St., New York 18, N. Y.

SALES EXECUTIVE, Desires position as sales manager or sales engineer. Excellent background contacting plants, developing and organizing manufacturers agents, jobbers, dealers on national basis. Gages, measuring instruments and small tools preferred. PW-828, American Machinist, 330 W. 42nd St., New York 18, N. Y.

SUPERVISOR of Tools and Factory supplies—50—with over 20 years experience in this position with one of the largest gasoline motor building concerns, building approximately 164 different model motors. Have knowledge of all standard and special tools, and miscellaneous items for building motors. Full knowledge of grinding wheels and tool salvage. References. PW-841, American Machinist, 520 N. Michigan Ave., Chicago 11, Ill.

EXPORT MANAGER—Machine Tools, etc. Unusually qualified. PW-842, American Machinist, 330 W. 42nd St., New York 18, N. Y.

DESIGN ENGINEER with over 20 years experience in Machine Tool, Special Machine and Fixture Design. Capable of taking charge. Available January. PW-839, American Machinist, 330 W. 42nd St., New York 18, N. Y.

(Continued on the opposite page)

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE

(Not available for equipment advertising)

60¢ per line, minimum 4 lines. To figure advance payment count 6 average words as a line.

POSITIONS WANTED (full or part-time individual salaried employment only), ½ above rates.

PROPOSALS, 50 cents a line an insertion.

INFORMATION

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE:

The advertising rate is $8.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. A.M.

NEW ADVERTISEMENTS received by 10 A. M. January 15th will appear in the issue of January 30th subject to limitation of space available

NOW AVAILABLE FOR MANUFACTURE

New type lightweight Diesel and Gasoline Engine. Experimental model built and tested. Orders on hand for 5,000 engines with potential of 40,000. Subject to delivery. Two sizes, one cylinder 15 HP, 2 cylinders 35 HP. Will license reliable manufacturer. In answering please submit size of plant and type of machine tools.

BO-845, AMERICAN MACHINIST
520 NORTH MICHIGAN AVENUE CHICAGO 11, ILL.

WARCO PRESSES
(Warren City Mfg. Co.)

Represented exclusively in Eastern Penna., Southern New Jersey, Delaware & Maryland.

By

Hahn & Brandt Machinery Co.
405 N. 5th Street Phila. 23, Pa.
MArket 7-1313

FOR SALE
TOOL AND DIE SHOP

With or without real estate; all machinery purchased after 1942; drafting and office equipment; excellent location for labor market; capacity 150 men; ground for expansion population 90,000, located in Eastern Pennsylvania; plant accessible to all truck lines and railroads; available February 1947; Principals only.

BO-854, AMERICAN MACHINIST
330 W. 42nd St., New York 18, N. Y.

FOREIGN DISTRIBUTOR LISTS

Have prepared during 25 years traveling abroad for first-class American manufacturers controlled lists of over 1500 excellent importers susceptible become distributors throughout world. Will code same for 3% commission on initial and subsequent orders obtained.

M-843 AMERICAN MACHINIST
330 West 42nd St., New York 18, N. Y.

WANTED

1¼" MODEL "C" CLEVELAND SINGLE SPINDLE AUTOMATIC SCREW MACHINES

State whether belt driven or motorized, speed, single or double cross slide, size of holes in turret, serial number, year built and working tolerances.

•

SPEAKMAN COMPANY
Riverview Works, Wilmington, Del.

WANTED

Waterbury Farrel Eyelet Presses, and Gang Slitters. Four slide Wire Forming Machines.

W-846, AMERICAN MACHINIST
330 W. 42nd St., New York 18, N. Y.

WANTED

2 Bliss No. 5 Spinning Lathes
2 Toledo No. 5A Punch Presses
2 Bliss No. 3½C Toggle Presses or suitable substitutes

The Enterprise Aluminum Co.
MASSILLON, OHIO

WANTED

Automatic Browne & Sharpe Screw Threading Machine, #00G High Speed. Late Models.

ZYLO WARE CORP.
11-15 47th AVENUE
LONG ISLAND CITY 1, N. Y.

WANTED

Transformer—1000/2500 KVA 25 Cycle.
Air Compressors—500 and 1000 cu. ft. synchronous, m.d.
Cranes—30-ton 80/90 ft. span alternating current 50-ton 56 ft. span direct current—must be modern.

W-847, AMERICAN MACHINIST
520 North Michigan Avenue, Chicago 11, Ill.

WANTED

One Grant double end automatic chamfering machine, Model #183 or Model #283.
One Barnes 201¼ Drill.

BECKETT BRONZE COMPANY
Muncie Indiana

WANTED

Cold Headers. Any size, type or condition. Top price paid.

G. B. DUPONT CO., INC.
Birmingham, Mich.

PROFESSIONAL SERVICES

DESIGN & DEVELOPMENT SERVICE

Designers—Engineers—Builders
Automatic & Packaging Machinery

61 S. Lexington Ave., White Plains, N. Y.

POSITIONS WANTED

(Continued from opposite page)

EXECUTIVE ENGINEER: age 37, desires permanent position as Works Manager, Chief Engineer or Executive Director. Well balanced background in metal fabrication and machine tool operations. Experience covers all phases of engineering—design research, development, standardization; purchasing—planning, procurement, follow-up, etc; manufacturing—production engineering, production control, welding engineering, factory cost control, manufacturing methods, industrial engineering, plant engineering, and labor relations. PW-852, American Machinist, 330 W. 42nd St., New York 18, N. Y.

SELLING OPPORTUNITY WANTED

ESTABLISHED IMPORT & export firm located in Shanghai, China desires additional connection with leading manufacturers. References furnished. Address: Ray Snyder c/o Dean Company, 26 O'Farrell Street, San Francisco 8, California.

SALES ENGINEER desires tools or products of merit by progressive organization requiring sales ability plus technical background. Good entree and experience in New York-North Jersey. Exclusive sales, commission. SA-853, American Machinist, 330 W. 42nd St., New York 18, N. Y.

PATENT ATTORNEY

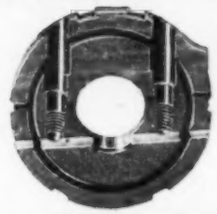
PATENT and Trade-Mark Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster Allwine & Rommel, Registered Patent Attorneys, Suite 453, 815-15th Street, N. W., Washington 5, D. C.

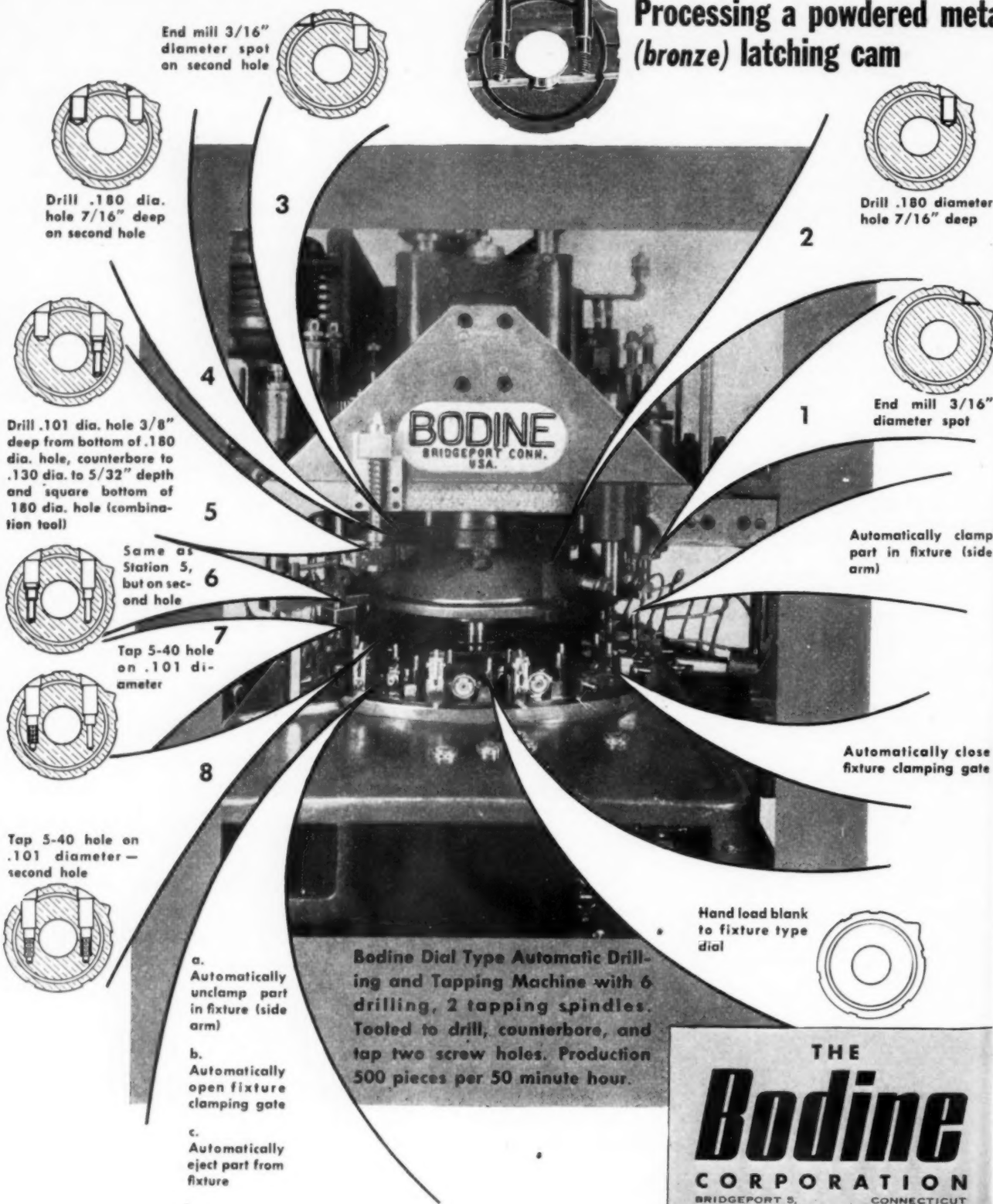
WANTED

ANYTHING within reason that is wanted in the field served by American Machinist can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

Bodine..Case History No. 20

Processing a powdered metal (*bronze*) latching cam





1 — End mill 3/16" diameter spot

2 — Drill .180 diameter hole 7/16" deep

3 — End mill 3/16" diameter spot on second hole

4 — Drill .180 dia. hole 7/16" deep on second hole

5 — Drill .101 dia. hole 3/8" deep from bottom of .180 dia. hole, counterbore to .130 dia. to 5/32" depth and square bottom of 180 dia. hole (combination tool)

6 — Same as Station 5, but on second hole

7 — Tap 5-40 hole on .101 diameter

8 — Tap 5-40 hole on .101 diameter — second hole

Automatically clamp part in fixture (side arm)

Automatically close fixture clamping gate

Hand load blank to fixture type dial

a. Automatically unclamp part in fixture (side arm)

b. Automatically open fixture clamping gate

c. Automatically eject part from fixture

Bodine Dial Type Automatic Drilling and Tapping Machine with 6 drilling, 2 tapping spindles. Tooled to drill, counterbore, and tap two screw holes. Production 500 pieces per 50 minute hour.

THE **Bodine** CORPORATION
BRIDGEPORT 5, CONNECTICUT

AUTOMATIC DIAL TYPE DRILLING, MILLING, TAPPING, AND SCREW INSERTING MACHINES

INDEX OF PRODUCTS ADVERTISED IN THIS ISSUE

Abrasives—29, 55, 81, 357

Accessories and Attachments (Machine Tool)—12-13, 22-23, 40, 59, 64B, 89, 223, 258, 306, 329, 336, 355, 357, 358, 359, 360, 362, 368, 370, 372, 376, 378, 379, 382, 383, 386, 390D

Boring, Drilling Machines (Horizontal)—260, 278, 307, 319, 336, 338, 424

Boring Mills (Vertical)—68-69

Broaching Machines—4-5, 48G, 371

Brushes—253

Cleaning Machines and Supplies—74, 246, 283, 370, 390G

Cut-off Machines; Saws—30, 309, 312, 314, 321, 335, 382

Die Casting Machines—41, 374

Drilling and Tapping Machines—16, 34-35, 48H, 52-53, 95, 309, 314, 322, 328, 332, 336, 338, 346, 424

Engineering and Production Services—367, 385

Finishing Machines—356

Gages and Instruments—51, 343, 346, 351, 364-365, 370, 376, 426, 428

Gear Cutters; Hobbing Machines—42, 338, 342

Gears, Speed Reducers, Motor Reducers—3, 6-7, 90, 92, 284, 285, 286, 288, 289, 290, 300A, 342, 390F

Grinders, Lappers, Hones, Polishers, Buffers—2nd Cover, 8-9, 10-11, 12-13, 14-15, 17, 20-21, 48-D, 56, 73, 80, 85, 213, 248, 309, 320, 336, 342, 346, 348, 350, 353, 390B, 430

Heat Treating Equipment and Supplies—384, 390E

Insurance—32-33

Jig Borers—84, 304, 308, 325

Lathes, Engine—28, 38, 50, 216, 220, 265, 315, 324, 337, 339, 341, 373, 384, 428

Lathes, Turret—16, 26, 27, 49, 73, 79, 227, 314, 354

Lubricants, Cutting Fluids, Quenching Oils, Rust Preventatives—38, 47, 98, 333-334, 349, 369, 386

Marking Machines—358, 382

Materials, Cutting and Forming—82, 214, 251, 305

Materials of Manufacture—67, 72, 218, 239, 243, 268, 269, 270-271, 277, 300

Materials Handling Equipment—242, 244, 382, 390B, 390D

Millers, Die Sinkers, Profilers—4-5, 10-11, 39, 54, 73, 75, 76-77, 80, 84, 304, 326, 336, 347, 428

Oil Purifiers—390C

Packaging—44

Parts and Equipment, Electrical—71

Parts and Equipment, Hydraulic and Pneumatic—65, 282, 390D

Parts and Equipment, Mechanical—46, 48F, 60, 62, 70, 233, 235, 247, 249, 252, 257, 259, 260, 261, 262-263, 264, 266, 267, 268, 272, 273, 275, 276, 279, 280, 300B, 306, 316, 318, 344-345, 371, 372, 378, 4th Cover

Photographic Service—352

Planers—54, 64

Presses, Forging and Forming Equipment and Supplies—36-37, 73, 78, 87, 88, 96, 100, 229, 231, 250, 288, 290, 291, 292, 293, 294, 296, 297, 298, 299, 301, 303, 304, 342, 346, 360

Riveting Machines—280, 282, 294

Safety Equipment—340, 387

Screw Machines; Chucking Machines—48, 48E, 310, 315, 319

Shapers, Slotters, Keyseaters—252, 307, 313, 317, 338, 354, 382, 428

Shop Furniture—86

Special Machine Tools—31, 45, 49

Threading Machines—12-13, 245, 322, 338

Tools, Cutting—18-19, 42-43, 48A, 48B, 48C, 57, 61, 63, 64A, 66, 91, 93, 94, 214, 225, 238, 258, 274, 282, 310, 323, 330-331, 346, 357, 360, 361, 363, 366, 375, 377, 381, 382, 386, 390A

Tools, Hand—94, 237, 240

Tools, Portable—58, 241, 368

Transportation—256, 286

Welding and Cutting, Brazing and Soldering Equipment and Supplies—281, 380, 382, 384

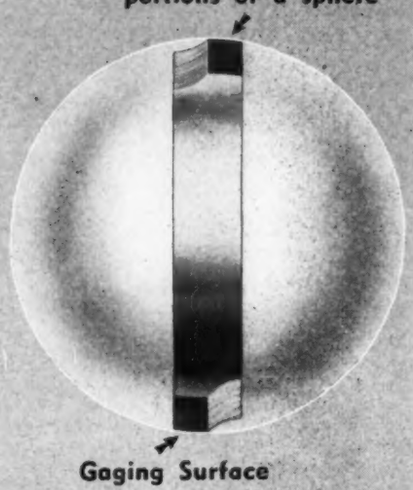
THE BETTER PLUG GAGE

STANDARD

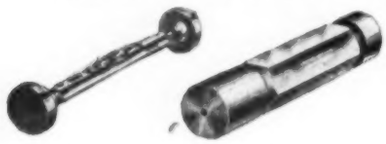
DuBo* Gage

SINGLE END
Sizes 1.510" to 6.010" (38 to 152 mm)

DOUBLE END
Sizes .240" to 1.510" (6 to 38 mm)

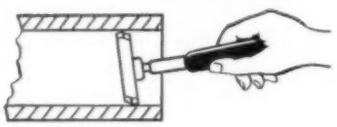


LIGHT IN WEIGHT



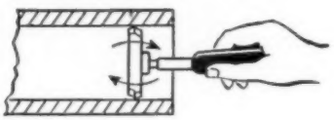
DuBo Gages over 1" diameter weigh 70% to 80% less than corresponding AGD cylindrical plug gages. Their lightness gives greater ease in handling, resulting in less strain on the operator, fewer errors due to fatigue.

EASY TO ENTER



DuBo requires no jockeying to enter, even into undersize bores. Inserted with the handle tipped slightly above the bore axis, it enters easily, more easily than even a piloted cylindrical plug gage. This means time saved.

DEFINITE CHECK



The check is made by lowering the handle gently, bringing gaging surfaces in contact with bore walls. Whether or not handle will drop freely below bore axis is the definite, yes-or-no answer even if part is close to limit.

DuBo Gages can detect out-of-roundness and taper whether enlarging toward or away from the opening!

ARMY E NAVY

*Patents Pending

IT ALL ADDS UP TO PRODUCT IMPROVEMENT *along with* COST SAVING

Write for Bulletin

STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.

ADVERTISERS INDEX

	Page
Abbott Ball Co.	272
Abrasive Machine Tool Co.	342
Acromark Company	382
Adams Co.	92
Air-Hydraulics, Inc.	296
Air Reduction	380
Ajax Manufacturing Co.	301
Allegheny Ludlum Steel Corp.	82
Allen-Bradley Co.	268a, 268b
Allied Products Corp.	296
Allis-Chalmers Mfg. Co.	71
Almond Mfg. Co., T. R.	358
Aluminum Co. of America	67
Amer. Chain & Cable Co., Inc.	312
American Gas Furnace Co.	390E
American Optical Co.	287
American Rolling Mill	218
American Screw Co.	267
American Swiss File & Tool Co.	240
American Tool Works Co.	16
Amer. Wheelabrator & Equip. Co	390G
Ames Co., B. C.	390H
Ames Precision Machine Works	428
Anton Machine Works	376
Apex Machine & Tool Co.	372
Armstrong-Blum Mfg. Co.	30
Armstrong Brothers Tool Co.	94
Atkins & Co., E. C.	274
Atlantic Screw Works	267
Atlas Bolt & Screw Co.	267
Atlas Press Co.	326
Automotive Gear Works, Inc.	300a
Avey Drilling Machine Co.	332
Baker Bros., Inc.	307
Barber-Colman	42, 43
Bardons & Oliver, Inc.	79
Barnes Co., Inc., W. O.	238
Barnes Drill Co.	48h
Baumbach Manufacturing Co., E. A.	290
Baush Machine Tool Co.	311
Bay State Abrasive Products Co.	55
Beatty Machine & Mfg. Co.	250
Bendinger Precision Co.	216
Bethlehem Steel Co.	305
Black & Decker Mfg. Co.	241
Blake Co., Edward	378
Blanchard Machine Co.	56
Blank & Buxton Machinery Co.	260
Bliss Co., E. W.	87
Bodine Corp.	424
Brad Foote Gear Works	390F
Bradford Machine Tool Co.	314
Brewer Machine Co., Wm. F.	342
Bridgeport Machines, Inc.	347
Brown & Sharpe Mfg. Co.	76, 77
Bryant Chucking Grinder Co.	51
Buffalo Bolt Co.	279
Buhr Machine Tool Co.	310
Bullard Co.	22, 23
Bunting Brass & Bronze Co.	48f
Butterfield Div., Union Twist Drill Co.	48c
Cadillac Gage Co.	343
Campbell Div. Andrew C., Amer. Chain & Cable Co., Inc.	312
Carboloy Co., Inc.	251
Card Manufacturing Co., S. W.	48b
Carlton Machine Tool Co.	34, 35
Central Screw Co.	267
Chandler Products Corp.	267
Chisholm-Moore Hoist Corp.	244
Cimcool Div., Cincinnati Milling Machine Co.	47
Cincinnati Bickford Tool Co.	95
Cincinnati Gear Co.	290
Cincinnati Gilbert Mach. Tool Co.	338
Cincinnati Grinders, Inc.	8, 9
Cincinnati Lathe & Tool Co.	373
Cincinnati Milling Mach. Co.	4, 5
Cincinnati Planer Co.	64
Cincinnati Shaper Co.	100
Circular Tool Co.	366
Clark Equipment Co. (Trucktractor Div.)	242
Clearing Machine Corp.	291
Cleveland Automatic Mach. Co.	3d Cover
Cleveland Crane & Engrg. Co.	229
Cleveland Punch & Shear Works Co.	78
Cleveland Twist Drill Co. (Momax Div.)	57
Columbus Die Tool & Mach. Co.	294
Columbus-McKinnon Corp.	244
Commander Mfg. Co.	336
Cone Automatic Machine Co.	48
Consolidated Machine Tool Corp.	75
Cosa Corporation	325
Continental Screw Co.	267
Corbin Screw Div., Am. Hdwe. Corp.	267
Coulter Machine Co., James	322
Covel Manufacturing Co.	17
Crafts Co., Inc., Arthur A.	376
Crystal Lake Grinders	348
Cullen-Friestedt Co.	382
Cushman Chuck Co.	383
Danly Machine Specialties, Inc.	96
Darnell Corporation	252
Davis & Thompson Co.	322
Davis Keyseater Co.	338
Dayton Rogers Mfg. Co.	294
Dayton Rubber Mfg. Co.	261
Defiance Machine Works, Inc.	278
DeLaval Separator Co.	390C
Delta Manufacturing Co.	309
Desmond-Stephan Mfg. Co.	366
Detroit Broach Co.	371
Detroit Die Set Corp.	304
Detroit Reamer & Tool Co.	381
Detroit Tap & Tool Co.	225
DeVlieg Machine Co.	84
Di-Noc Co.	352
Disston & Sons, Inc., Henry	91
DoAll Co.	315
Dodge Mfg. Corp.	300b
Du Pont de Nemours & Co., Inc., Electrochemicals Dept.	74
Earle Gear & Machine Co.	288
Eastern Machine Screw Co.	358
Elastic Shop Nut Corp. of America	264
Employers Mutual Liability Ins. Co. of Wisconsin	32, 33
Errington Mechanical Laboratory	378
Etna Machine Co.	335
Ex-cell-O Corp.	65
Fab-Weld Corporation	272
Fafnir Bearing Co.	255
Falk Corporation	262, 263
Famco Machine Co.	304
Farrel-Birmingham Co., Inc.	289
Federal Press Co.	292
Fellows Gear Shaper Co.	6, 7
Firth-Sterling Steel Co.	243
Fitchburg Grinding Mach. Corp.	48d
Foote-Burt Co.	48g
Formica Insulation Co.	300
Formspray Co.	272
Fosdick Machine Tool Co.	52, 53
Gallmeyer & Livingston Co.	320
Ganschow Gear Co.	290
Gardner Machine Co.	350
Gear Grinding Machine Co.	272
Gear Specialties Mfrs.	90
General Die & Stamping Co.	368
General Elec. Co., Plastics Div. LN	288
General Engrg. & Mfg. Co.	313
General Machinery Corp.	265
General Mills Mechanical Div.	367
Geometric Tool Co.	64B
Gilmore & Co., F. F.	360
Gisholt Machine Co.	49
Gits Bros. Mfg. Co.	280
Gleason Works	3
Gorham Tool Co.	377
Gorton Machine Co., George	80
Goss & deLeeuw Machine Co.	310
Graham Mfg. Co.	386
Grant Gear Works	290
Grant Mfg. & Machine Co.	294
Gray Co., G. A.	54
Greenfield Tap & Die Corp.	64A
Greenlee Bros. & Co.	319
Gulf Oil Corp.	83

It's portable! *It's New!*

AMES HARDNESS TESTER

Accurate
Speedy
Easy to use

Tests rounds and flats up to 1" direct in Rockwell scales with diamond and ball penetrators. Brinell readings easily transposed. Weighs less than 2 pounds. Quick to set.

Convenient to carry. Durable, rustless, quality built.

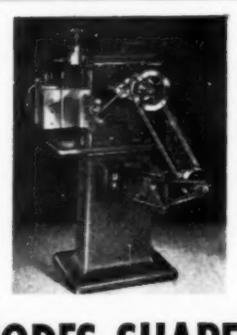
Complete with diamond and ball penetrators test blocks, round and V-anvils and conversion chart, all for only **$187.50**

PRECISION LATHES

Ames Plain Precision Bench Lathes have been made and sold, almost without change during the past 40 years, for use in tool rooms, manufacturing plants and laboratories. They will do the most accurate turning, drilling, grinding, milling and threading, are quickly set up for short or long jobs, start and stop momentarily, require little power and are compact. They excel in the manfacture of interchangeable parts, with production rates often comparing favorably with less accurate methods. In the manufacture of parts requiring a variety of operations, these plain precision bench lathes with their quick changing tools and attachments provide the only practical method. In open or enclosed head models.

MILLING MACHINES

AMES PRECISION BENCH MILLING MACHINES are built to do most accurate milling . . . substantial in size and proportions to obtain rigidity . . . easily set up and taken down . . . well suited for production work or short runs to relieve larger machines . . . self-contained, portable, require little floor space and operate with ½ h.p. motors. Horizontal, vertical or bench models.



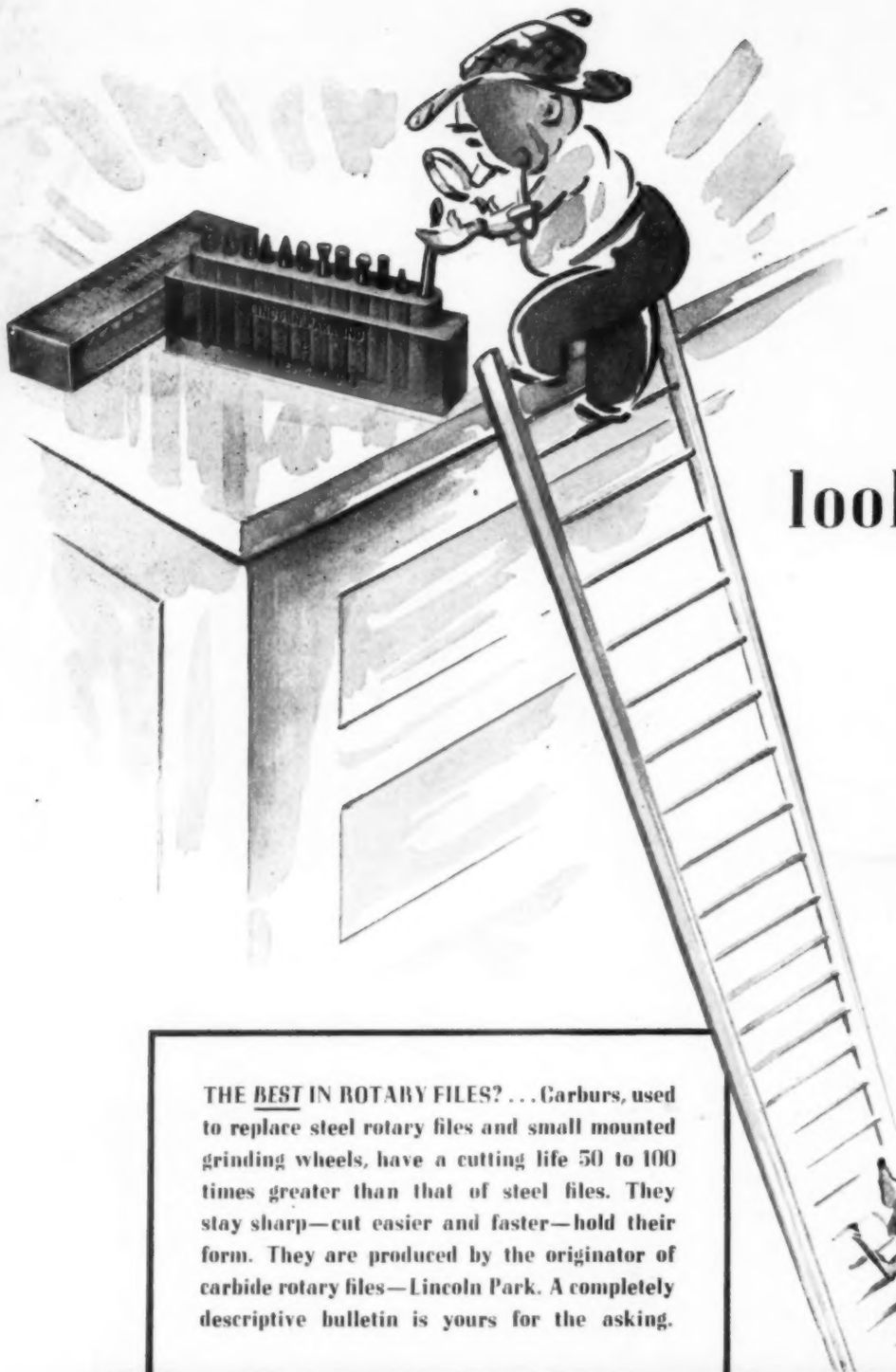
RHODES SHAPERS

Although intended for light and very accurate shaping and slotting, Rhodes machines will accommodate fairly large work in the toolroom or in production. Work can be set up quickly and easily in them, and short jobs to relieve larger machines can be handled. They are particularly well suited for educational purposes, and many of them are now installed in vocational schools, colleges and universities throughout the country. Horizontal, vertical or convertible models.

AMES PRECISION MACHINE WORKS, WALTHAM 54, MASS., U. S. A.

ADVERTISERS INDEX

	Page
Hamilton Tool Co.	390D
Hammel-Dahl Co., Woolley Div.	288
Hammond Machinery Builders, Inc.	248
Hansen Manufacturing Co.	273
Hanson Whitney Machine Co.	245
Hardinge Brothers, Inc.	89
Harper Co., H. M.	267
Harrison Radiator Div., Gen. Motors Corp.	60
Hartford Special Machinery Co.	342, 376
Haynes Stellite Co.	344, 345
Heald Machine Co.	2d Cover
Hendey Machine Co.	354
Hollingshead Corp., R. M.	44
Holliston Mills, Inc.	72
Hones, Inc., Charles A.	384
Huot Mfg. Co.	386
Hydraulic Press Mfg. Co.	41
Ideal Industries, Inc.	355
Independent Pneumatic Tool Co.	58
Ingersoll Milling Machine Co.	93
Ingersoll Steel & Disc. Div., Borg Warner Corp.	323
International Nickel Co., Inc.	269
International Screw Co.	267
J & S Tool Co.	376
Johnson Bronze Co.	275
Jones & Lamson Machine Co.	73
Jones & Laughlin Steel Corp.	270, 271
Kearney & Trecker Corp.	39
Kennametals, Inc.	361
Kester Solder Co.	384
King Machine Tool Co.	68, 69
Knu-Vise, Inc.	360
Koebel Diamond Tool Co.	346
Kux Machine Co.	374
L. W. Chuck Co.	362
Lake Erie Engineering Corp.	298, 299
Laminated Shim Co., Inc.	254
Lamson & Sessions Co.	267
Landis Machine Co.	12, 13
Landis Tool Co.	14, 15, 24, 25
Leach Machinery Co., Inc., H.	306
Lee Co., K. O.	85
Leland-Gifford Co.	328
Lempco Products, Inc.	88
Lincoln Park Industries, Inc.	430
Linley Brothers Co.	304
Lipe-Rollway Corp.	341
Littell Machine Co., F. J.	382
Lodge & Shipley Mach. Tool Co.	223
Logan Engineering Co.	317
Lord Manufacturing Co.	259
Luers, J. Milton	382
Lyon Machine Co.	258
M and M Machine Co.	346
Madison Mfg. Co.	363
Malleable Founders Society	390B
Manheim Mfg. & Belting Co.	46
Marlin-Rockwell Corp.	62
McGraw-Hill Book Co., Inc.	284, 302, 390F
McKiernan-Terry Corp.	302
Mead Specialties Co.	390D
Meisel Press Mfg. Co.	290
Metro Tool & Gage Co.	351
Michigan Broach Co.	385
Mid-West Abrasive Co.	81
Milford Rivet & Machine Co.	267
Miller-Knuth Mfg. Co.	382
Mitts & Merrill	382
Moline Tool Co.	336
Molybdenum Corp.	277
Monarch Machine Tool Co.	227
Moore Special Tool Co.	308
Morey Machinery Co., Inc.	314
Morse Chain Co.	266
Morse Twist Drill & Mach. Co.	18, 19
Motch & Merryweather Co.	321
National Automatic Tool Co. Inc.	45
National Lock Co.	267
National Lock Washer Co.	268
National Mach. Tool Co.	379
National Screw & Mfg. Co.	267
National Twist Drill & Tool Co.	331
Newark Gear Cutting Mach. Co.	338
New Britain Machine Co. New Britain-Gridley Mach. Div.	220
New Departure Div. Gen Motors Corp.	233
New England Screw Co.	267
The N. Y., New Haven & Hartford R.R. Co. The New England Transp. Co.	256
Niagara Mach. & Tool Works	303
Nice Ball Bearing Co.	318
Nicholson & Co., W. H.	258
Nicholson File Co.	237
Noble & Westbrook Mfg. Co.	358
Norgren Co., C. A.	257
Norma-Hoffman Bearings Corp.	247
Norton Company	20, 21, 29
O.K. Tool Co.	357
Oakite Products Inc.	283
Oliver Instrument Co.	336
O'Neil-Irwin Mfg. Co.	294
Optimus Equipment Co.	246
Orange Roller Bearing Co., Inc.	249
Osborn Manufacturing Co.	253
Parker-Kalon Corp.	70, 267
Pawtucket Screw Co.	267
Perkins Machine & Gear Co.	284
Pheoll Manufacturing Co.	267
Philadelphia Gear Works, Inc.	285
Phillips Screw Manufacturers	267
Pope Machinery Co.	329
Potter-Johnston Machine Co.	48e
Pratt & Whitney Div., Niles-Bement-Pond Co.	59
Production Machine Co.	346
Producto Machine Co.	296
Railway Express Agency, Air Exp. Div.	286
Randall Co., Frank E.	346
Rano Bronze Corp.	268
Reading Screw Co.	267
Reed-Prentice Corp.	339
Reed-Rolled Thread Die Co.	338
Refiners Lubricating Co.	340
Reynolds Metals Co., Inc. Aluminum Div.	239
Rivett Lathe & Grinder, Inc.	28
Roberts Rubber Co., Weldon	375
Rollway Bearing Co. Inc.	316
Russell Burdsall & Ward Bolt & Nut Co.	267
Safety & Maintenance Co.	340
Sales Service Mach. Tool Co.	252
Schrader's Sons, A.	297
Scovill Manufacturing Co.	267
Sellew Machine Tool Co.	390D
Seneca Falls Machine Co.	337
Shakeproof, Inc.	267
Sheffield Corp.	213
Sheldon Machine Co.	384
Shore Instrum. & Mfg. Co., Inc.	370
Sidney Machine Tool Co.	38
Sier-Bath Gear & Pump Co., Inc.	286
Sigourney Tool Co.	346
Simonds Saw & Steel Co.	63
Smith Corporation, A. O.	281
Socony-Vacuum Oil Co., Inc.	349
South Bend Lathe Works	324
Southington Hardware Mfg. Co.	267
Split Ball Bearing Corp.	306
Springfield Mach. Tool Co.	50
Standard of California	369
Standard Gage Co., Inc.	426
Standard Machinery Co.	360
Standard Oil Co. (Indiana)	333, 334
Standard Pressed Steel Co.	86, 378
Staples Tool Co.	61
Starrett Co., L. S.	214
Steel Company of Canada, Ltd.	267
Steelweld Machy. Div., Cleveland Crane & Engineering Co.	229
Sterling Bolt Co.	267
Sterling Grinding Wheel Div.	353
Strand Co., N. A.	368
Strong Carlisle & Hammond Co.	280
Stronghold Screw Products, Inc.	267
Stuart Oil Co. Ltd., D. A.	386
Sturgis Products Co.	356
Super Tool Co.	66
Tannewitz Works	314
Taylor Machine Co.	290
Texas Co.	98
Thomas Hoist Co.	390B
Thriftmaster Products Div. of Thomson Industries, Inc.	368
Timken Roller Bearing Co.	4th Cover
Tomkins-Johnson Co.	282
Torrington Co.	235, 294
Townsend Mfg. Co., H.P.	280
Union Carbide & Carbon Corp.	344, 345
Union Twist Drill Co.	48A
U. S. Drill Head Co.	370
V. & O. Press Co.	295
Valvair Corp.	306
Vanadium Alloys Steel Co.	293
Van Keuren Co.	364, 365
Van Norman Co.	10, 11
Veraloy Products Ltd.	268
Victor Machinery Exchange, Inc.	390A
Vinco Corporation	276
Vulcan Tool Corp.	31
Walker Co., Inc., O. S.	359
Waltham Machine Works	342
War Assets Administration	378, 388, 390
Warner & Swasey Co.	26, 27
Waverly Petroleum Products Co.	340
Wells Mfg. Corp.	327
West Disinfecting Co.	370
West Point Mfg. Co.	260
Whistler & Sons Inc., S. B.	231
White & Bagley Co.	386
Wilson, K. R.	36, 37
Wilson Mechanical Instrument Co.	370
Winter Brothers Co.	330
Wolverine Bolt Co.	267
Zagar Tool Co., Inc.	40



looking for

?

THE *BEST* IN ROTARY FILES? . . . Carburs, used to replace steel rotary files and small mounted grinding wheels, have a cutting life 50 to 100 times greater than that of steel files. They stay sharp—cut easier and faster—hold their form. They are produced by the originator of carbide rotary files—Lincoln Park. A completely descriptive bulletin is yours for the asking.

Lincoln Park INDUSTRIES, INC.

1723 FERRIS AVENUE • DETROIT 25, MICHIGAN

V CINCINNATI DIE SINKER USES 32 TIMKEN BEARINGS

of the spectacular post-war progress being modern machine tool development is the ncinnati 16" Vertical Hydro-Tel Die Sinker has introduced some valuable production s into this important operation.

hown in the photograph, the machine is dupli- ing a single-throw crankshaft die (left) from a aster pattern (right), scanning the pattern auto- atically and thus relieving the operator of con- derable work and responsibility during the pro- gress of the cut.

Additional advantages stressed by the manufacturer are: saving of time in roughing out die impression because of the heavy cuts that can be taken; saving of time in hand finishing due to the accuracy of the machine-cut die impression.

The Cincinnati Milling Machine Company for many years has made liberal use of Timken Tapered Roller Bearings as an important aid to precision, endurance and economy. In this case 32 Timken Bearings are used to eliminate friction, reduce wear, carry radial, thrust and combined loads and hold moving parts in correct and constant alignment.

Look for the trade-mark "TIMKEN" on every tapered roller bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.

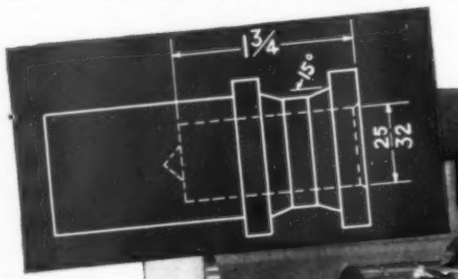
TIMKEN

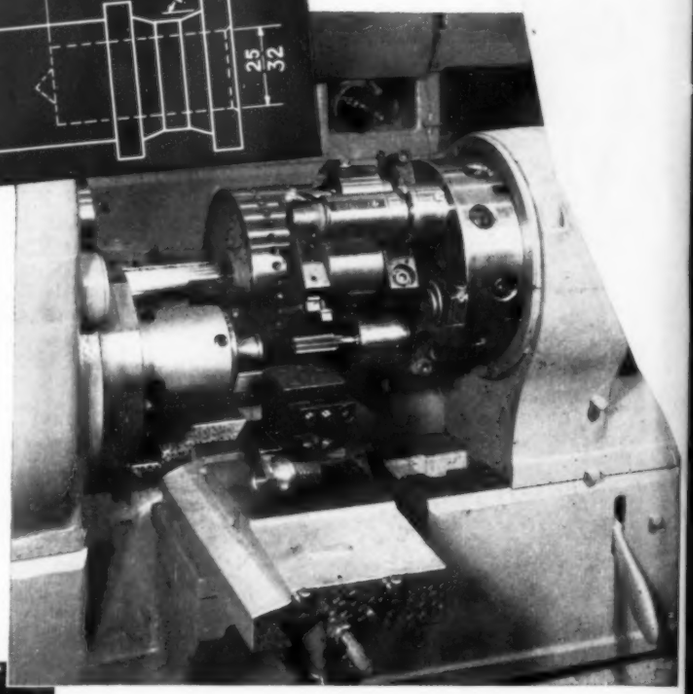
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

48 Years of Engineering and Metallurgical Development.

DOUBLE CHUCKING WORK ON CLEVELAND AUTOMATICS?—CHA



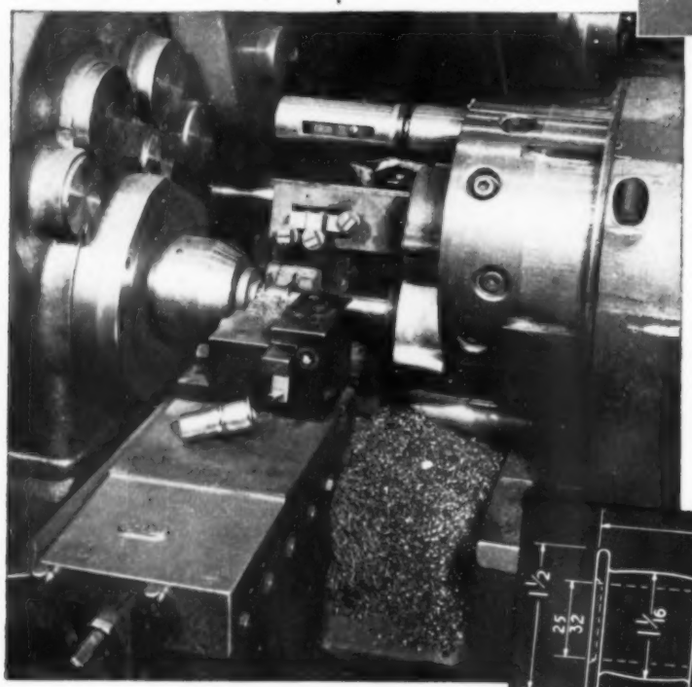


If you are not familiar with the automatic chucking advantages of Cleveland Single Spindle Automatics, check this...

17 blanking and finishing operations, working inside and out from both ends, are completed on this team of Cleveland "2½ A" machines.

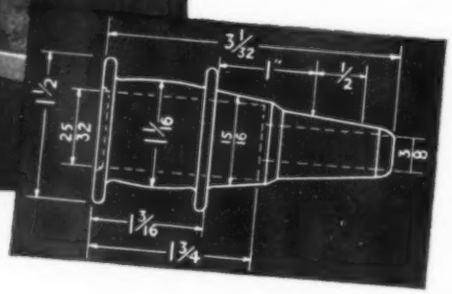
CAST IRON BLANKS, not too evenly shaped, are furnished to make a "whirl" for textile machinery.

FIRST OPERATIONS . . . Station 1 carries a clamp-fit conveying fixture into which the blank stem is loaded, and which conveys blank to automatic air chuck . . . Station 2 drills 23/32" hole 1 27/32" deep and chamfers front, while rear cross-slide faces outside, and center turning stem rough turns OD. . . . Station 3 counterbores inside taper, while front cross-slide rough forms the whirl diameter and finish-faces end . . . Station 4 reams the taper, and Station 1 is in position for operator to insert next piece. At position 5 part is automatically ejected.



FINISH OPERATIONS. (on second machine) Similar loading fixture to above. Piece is reversed and taper-bored end is driven by turret onto taper arbor on spindle.

Station 2 rough turns 15/16" diameter and taper diameter; rough faces and spots end for drill . . . Station 3 drills 3/8" through to larger opening, while rear cross-slide semi-finishes whirl OD and finish forms taper diameter next to flange . . . Closely following, front cross-slide finish forms OD and whirl diameter, finish faces, chamfers end and finish forms end taper . . . Stations 4 and 5 are open . . . Part is automatically ejected, and hand loading of station 1 fixture continues cycle.



THIS IS TYPICAL of the versatility of Cleveland Automatic set-up possibilities, which we can point up more clearly for you in a production study or proposal on one of YOUR jobs . . . Call on Cleveland, because Clevelands Cut Cost.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

4928 BEECH STREET • • CINCINNATI 12, OHIO

CHICAGO (6) 1408A Civic Opera Bldg. CLEVELAND (3) 2269A Ashland Rd. DETROIT (2) 540A New Center Bldg.

HARTFORD (1) 529A Capital National Bank Bldg. NEW YORK (6) 2402A Singer Bldg.